EXPRESS5800/1160Xd/1320Xd

User's Guide

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Using This Guide

This User's Guide provides a quick reference to information about your server system. Its goal is to familiarize you with your system and the tasks necessary for system setup and operation.

This guide contains the following information:

- Chapter 1, **"**System Overview," provides an overview of your system and describes your system's major system components. See this chapter to familiarize yourself with your system.
- Chapter 2, "System Operation," tells you how to set up the server, how to start up, shut down, and reboot the system, how to boot the OS, and how to use the DVD-ROM drive and optional tape drive.
- Chapter 3, "Service Processor," describes service processor functions. This chapter includes information about the SP console, OS console, Virtual SOP, and service processor commands.
- Chapter 4, "BIOS Setup," provides you with a description of the BIOS Setup utility and its options for configuring the server.
- Chapter 5, "I/O Board Installation," shows you how to install I/O boards in the server. Information includes slot identification and board installation in the PCIX unit.
- Chapter 6, "Problem Solving" contains helpful information for solving problems that might occur with your system.
- Appendix A, "Technical Specifications" provides specifications for your server system.
- Appendix B, "Memory Upgrade" provides memory configuration information necessary for adding memory to the server. Information includes allowable memory configurations, memory slot locations, and how to allocate memory.
- Appendix C, "Windows 2003 Installation" provides information for installing Microsoft® Windows® 2003 on the Express5800/1000 series server and for creating a mirrored drive of Windows 2003.

Text Conventions

This guide uses the following text conventions.

Warnings, cautions, and notes have the following meanings:

WARNING

Warnings alert you to situations that could result in serious personal injury or loss of life.

CAUTION

Cautions indicate situations that can damage the system hardware or software.

Note: Notes give important information about the material being described.

- Names of keyboard keys are printed as they appear on the keyboard. For example, **Ctrl**, **Alt**, or **Enter**.
- Text or keystrokes that you enter appear as boldface type. For example, type **abc123** and press **ENTER**.
- File names are printed in uppercase letters. For example, AUTOEXEC.BAT.

Related Documents

In addition to this guide, the following system documentation is included with your server either as electronic files on EXPRESSBUILDER or as paper copy shipped with your server.

- *System Release Notes*
  Release Notes provide you with the latest information about your system. This information was not available to be included in your user's guide at the time it was developed and released.
- *Site Preparation Guide*
  The Site Preparation Guide contains information required for preparing the site for your server installation.
- *Installation Procedures*
  The Installation Procedures document provides procedures for installing the server at the site, including unpacking the server, setting up the chassis components, and connecting the power cables.

⚠ CAUTION

The Express5800/1160Xd/1320Xd server requires installation by qualified personnel such as an NEC technician and system administrator.

- *ServerCare^{SM} Guide*
  The ServerCare Guide contains information about NEC's warranty and server registration.

Safety Notices

⚠ WARNING

To avoid a risk of injuries, installation should be performed by trained technical personnel.

Your server is equipped with a front stabilizer. Engage the front stabilizer during installation. For stability and to distribute the weight, also attach side stabilizers. Otherwise, the rack may topple over and cause injuries.

If you extend two or more devices from the rack at the same time, the rack may topple over on you. Extend only one device from the rack at a time.

Exercise great care not to hurt your fingers on the rail when you mount/dismount the equipment into/from the rack.

Lithium batteries can be dangerous. Improper handling of lithium batteries may result in an explosion. Dispose of lithium batteries as required by local ordinance. Replace only with the same or equivalent type battery.

The DVD-ROM drive uses a laser beam. Do not look or insert a mirror inside while the system is on. A laser beam is invisible; if your eyes get exposed to it, there is a risk of losing your eyesight.

- Elevated Operating Ambient Temperature – If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient environment. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum rated ambient temperature of 89.6°F.
- Reduced air Flow – Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. Ensure that nothing is placed on top of the system cabinet.
- To prevent fires, and damage to rack equipment and supply wiring, make sure that the rated load of the power branch circuit is not exceeded. Equipment nameplate ratings should be used when addressing this concern. For more information on installation and wiring of power-related facilities, contact your electrician or local power company.
- To prevent electrical shock, connect all rack and rack support equipment to the same electrical circuit of the building wiring. If you are unsure, check the building wiring to avoid remote earth conditions.
- For safe operation, only connect the equipment to a building supply that is in accordance with current wiring regulations in your country. In the USA those wiring standards are regulated by Underwriter Laboratories (UL); in the U.K. by the Institution of Electrical Engineers, (IEE) and in Canada by the Canadian Standards Association (CSA).

⚠ WARNING

Some locations within the server have high voltage and therefore are very dangerous. To avoid risk of electric shock, turn off all server power and disconnect power cables before working inside the server unit.

The main power of your server is turned off by turning off the power source to the server or removing the power cable.

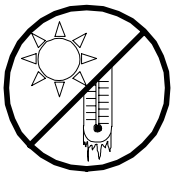
Before touching the parts in the server, wait for at least 10 to 15 seconds until residual voltage is discharged.

Safety Notices for Users Outside of the U.S.A. and Canada

- **PELV (Protected Extra-Low Voltage) Integrity:** To ensure the extra-low voltage integrity of the equipment, connect only equipment with mains-protected electrically-compatible circuits to the external ports.
- **Remote Earths:** To prevent electrical shock, connect all local (individual office) computers and computer support equipment to the same electrical circuit of the building wiring. If you are unsure, check the building wiring to avoid remote earth conditions.
- **Earth Bonding:** For safe operation, only connect the equipment to a building supply that is in accordance with current wiring regulations in your country. In the USA those wiring standards are regulated by Underwriter Laboratories (UL); in the U.K., by the Institution of Electrical Engineers, (IEE) and in Canada by the Canadian Standards Association (CSA).

Care and Handling

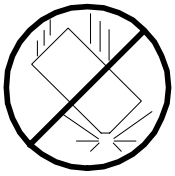
Use the following guidelines to properly handle and care for your system.



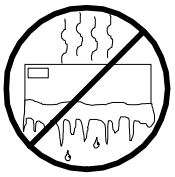
Protect the system from extremely low or high temperatures. Let the system warm (or cool) to room temperature before using it.

Keep the system away from magnetic forces.

Keep the system dry. Do not wash the system with a wet cloth or pour fluid into it.



Protect the system from being bumped or dropped.



Check the system for condensation. If condensation exists, allow it to evaporate before powering on the system.

Keep the system away from dust, sand, and dirt.

1

System Overview

- Overview
- System Features
- System Configurations
- Main Components
- System Functions
- Expansion
- Security

Overview

Your Express5800/1000 series server is a modular, multiprocessing server based on the Intel® Itanium® 2 64-bit processor. The combination of Intel Itanium 2 architecture, along with your server's innovative crossbar switch and high-speed memory access technology, provides for massive power and scalability using the latest available operating systems. Your server is ideal for large-scale applications as well as compute intensive environments. Your server is conveniently housed in a standalone cabinet (see Figure 1-1).

Figure 1-1. Express5800/1160Xd/1320Xd Server

Advanced features of your Express5800/1000 series server include:

- High-speed processing and high scalability
  High-speed processing is realized through a combination of the new Intel CPU and NEC crossbar switch and high-speed memory access technologies. Supporting up to 32 CPUs (32-way model) and employing the advanced PCI-X bus to connect peripheral and network devices, the Express5800/1000 series server can be configured with up to 112 I/O slots (32-way model), demonstrating the high scalability ideal for large-scale configurations.

- Partitioning functionality for flexible system operation
  Your server can be partitioned at the hardware level, enabling each subsystem to operate as an independent computer system. It is possible to divide a 32 CPU system configuration into 8 subsystems, each of which has 4 CPUs, and let them each operate separately. In this way, it's possible to allocate processor capacity according to workload status, resulting in flexible system operation and guaranteed security.

- High reliability and availability
  Many hardware components, such as the clock, power, fan, and service processor, allow redundancy, and the CPU/memory cell board and I/O card hardware are hot-swap compliant. Easy system recovery is possible even at the time of failure.

System Features

The Express5800/1000 series servers feature:

- Quad high-performance Intel® Itanium® 2 64-bit 1.3GHz/3MB or 1.5GHz/6MB processors per Cell Board.
- Cell Board supporting the installation of up to 4 CPUs (Intel Itanium 2 processors).

  In addition, each Cell Board has 16 DIMM sockets plus a memory daughterboard with 16 DIMM sockets for a total of 32 DIMM sockets. Each Cell Board/daughterboard combination supports from 4 GB (using four 1-GB DIMMs) up to 32 GB (using thirty-two 1-GB DIMMs) of ECC SDRAM four-way interleaved memory.
- Intelligent Service Processor (iSP) Board which provides system management and diagnostic functions
- Clock Board which provides clock distribution
- PCIX Unit in two versions, Base Unit and Core Unit:
  - 14 available PCI-X expansion slots in a Base Unit model; includes eight 64-bit/66-MHz hot-swap PCI-X slots and six 64-bit/133-MHz hot-swap PCI-X slots.
  - 12 available PCI-X expansion slots, a Basic I/O Board with 2 USB, 2 IDE, and 1 Keyboard interfaces, a VGA card with an analog interface, and a DVD-ROM unit in a Core Unit model to allow a bootable partition. The Core Unit model includes eight (six available) 64-bit/66-MHz hot-swap PCI-X slots and six available 64-bit/133-MHz hot-swap PCI-X slots.
  - DVD-ROM unit in a Core Unit
  - Bay for an optional DAT unit or optional USB FDD
  - Six hot-swap SCSI hard disk drive bays accessible from the front of the unit; each drive bay can contain a 36-GB, 73-GB, or 146-GB SCSI hard disk drive.
- Hot-swap SCSI disk drive backplane; a failed drive can be removed and replaced with a new drive without system power being turned off (if software mirror has been configured).
- Hardware monitors (temperature, fans, and voltage) and software monitors to indicate failures.

- Up to two Power Bay Units can be installed in the Main Cabinet. Up to 12 Distributed Power Supply (DPS) modules can be installed. When a 2N redundant system is configured, up to 3 Power Bay Units can be installed. In this case, the primary power is supplied from two AC power distribution units.
- One Power Bay Unit can be installed in the I/O Expansion Cabinet. Up to six DPSs can be installed. When a 2N redundant system is configured, up to 2 Power Bay Units can be installed.
- Six fans are installed in the 16-way server and 11 fans are installed in the 32-way server. Any fan module can easily be removed and installed, without powering down the system.

System Configurations

Main system features are described for each of the Express5800/1000 series standalone models as follows.

- Express5800/1160Xd Main Cabinet — 16-way server; supporting up to 4 Cell Boards, with a total of up to 16 CPUs and memory expandability up to 128 GB using 1-GB DIMMs.

  The 16-way server supports the installation of up four PCIX units (one is required). See Figure 1-2.

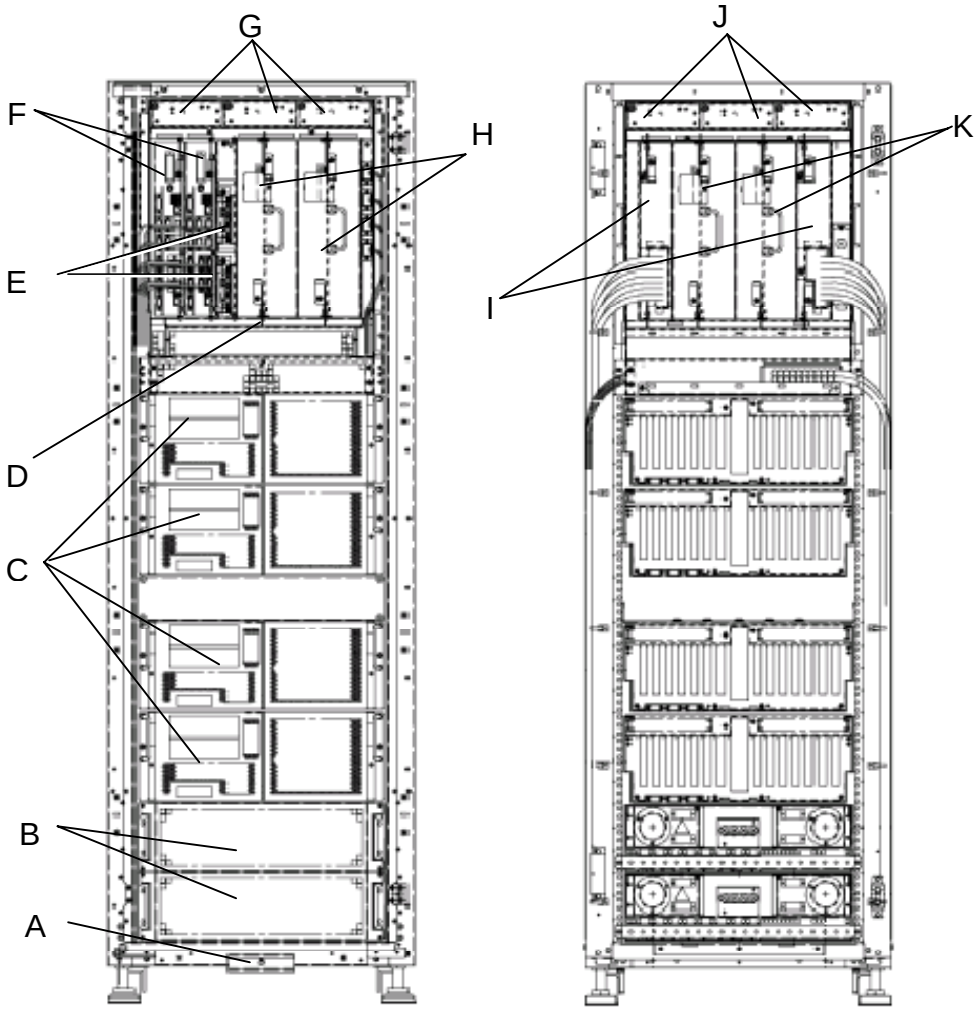
- Express5800/1320Xd Main Cabinet — 32-way server, supporting up to 8 Cell Boards, with up to 32 CPUs and memory expandability up to 256 GB using 1-GB DIMMs.

  The 32-way server supports the installation of up two PCIX units (one is required). See Figure 1-3.

- Express5800/1320Xd I/O Expansion Cabinet — expansion cabinet supporting up to six PCIX units (one is required). See Figure 1-4.

Figure 1-5 shows PCIX unit features. Figure 1-6 shows internal views of Cell Board features. For memory slot locations and configuration information, see Appendix B.

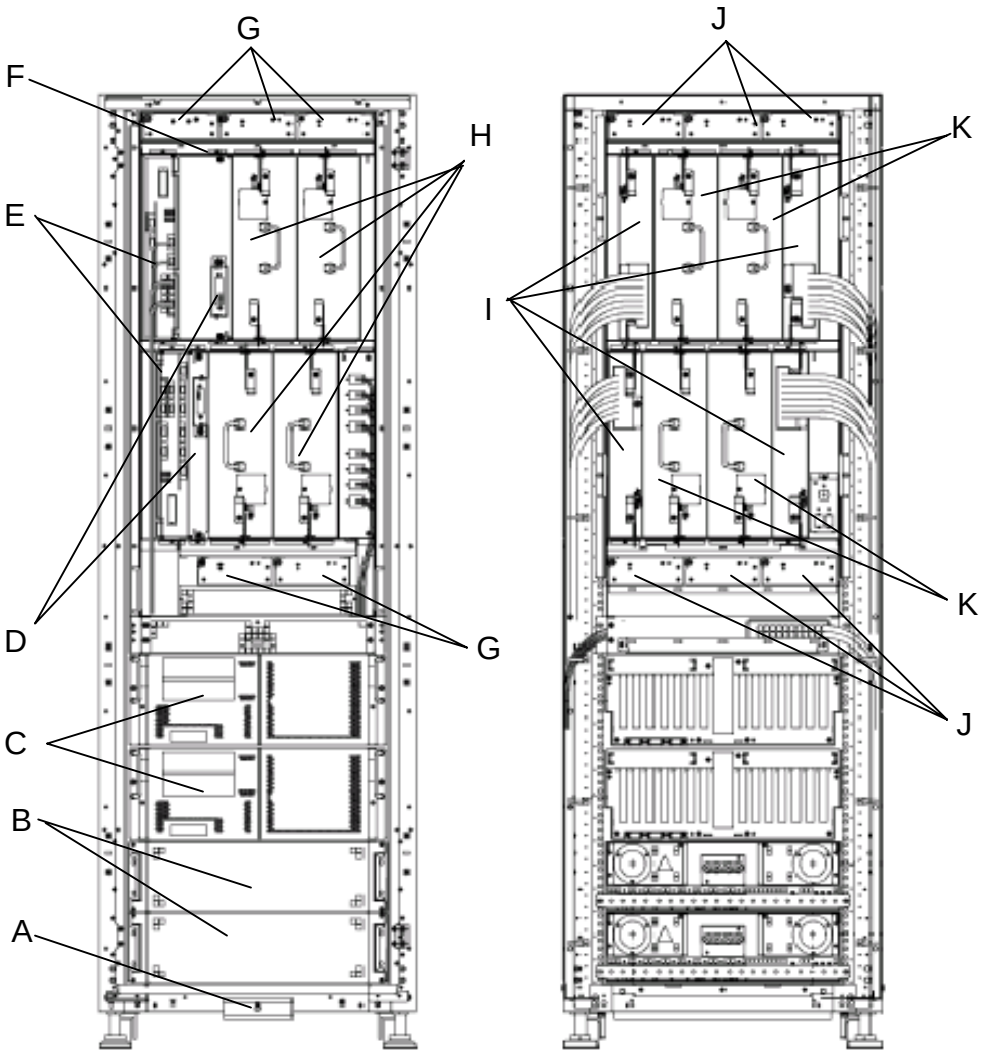
See Appendix A, “Technical Specifications,” for a list of system specifications.



A	Front Stabilizer Handle	G	Front Fans
B	Power Bay Units	H	Front Cell Boards
C	Base or Core PCIX Units	I	XBC Boards
D	UUID Label	J	Rear Fans
E	Clock Boards	K	Rear Cell Boards
F	iSP Boards		

Note: Maximum configuration shown.

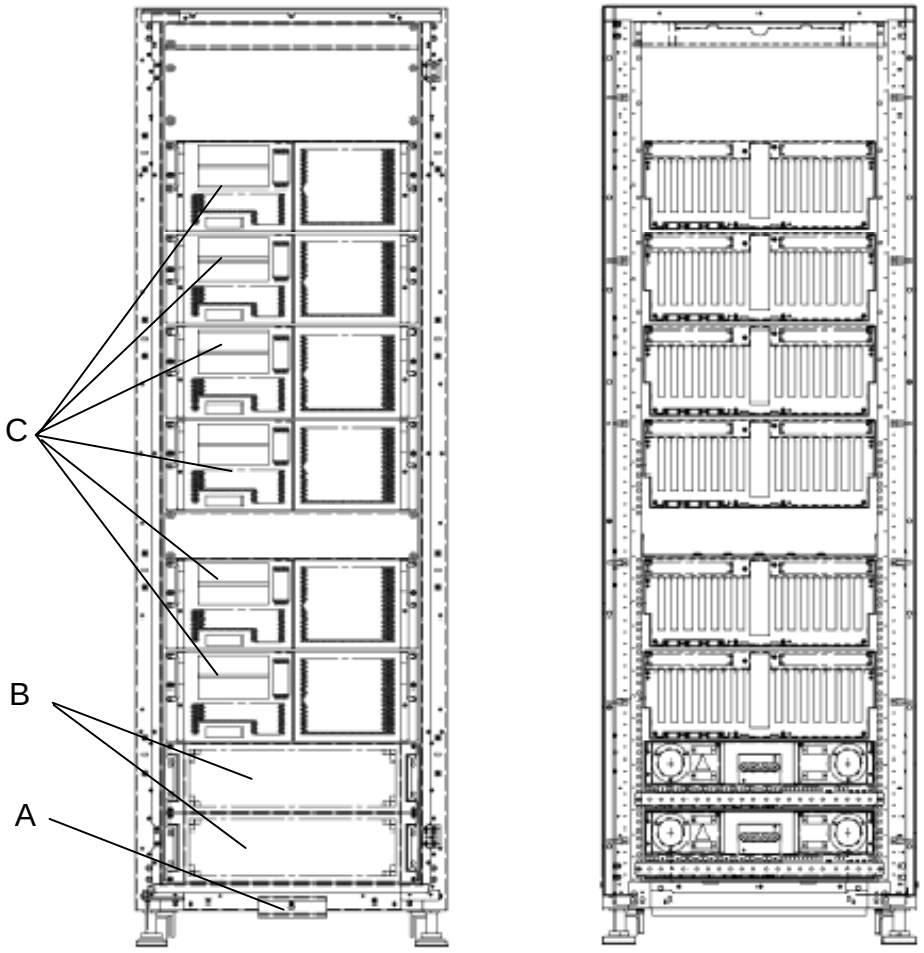
Figure 1-2. 16-Way Server Configuration



A	Front Stabilizer Handle	G	Front Fans
B	Power Bay Units	H	Front Cell Boards
C	Base or Core PCIX Units	I	XBC Boards
D	Clock Boards	J	Rear Fans
E	iSP Boards	K	Rear Cell Boards
F	UUID Label		

Note: Maximum configuration shown.

Figure 1-3. 32-Way Server Configuration



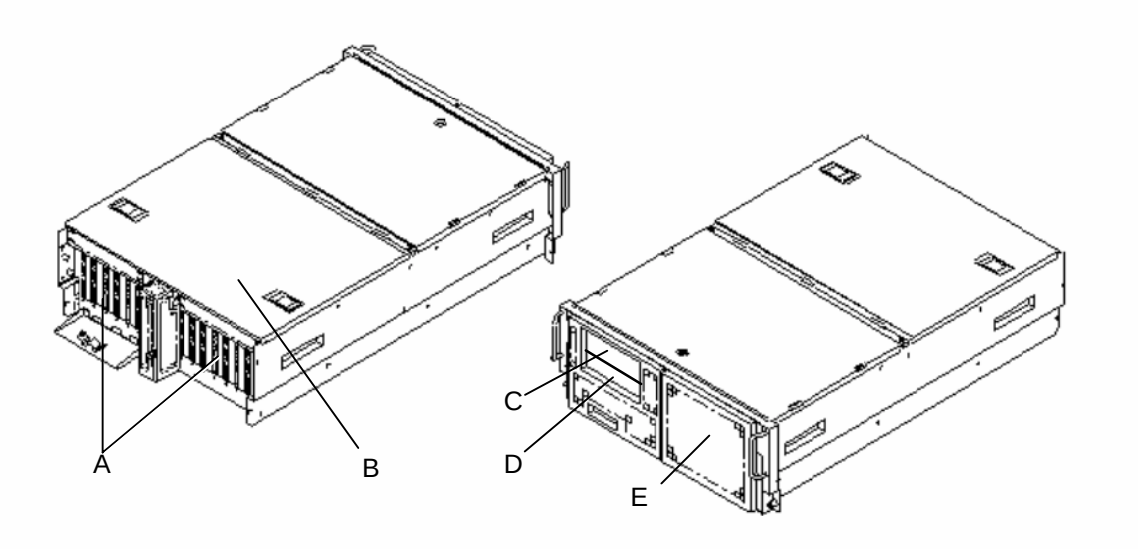
A Front Stabilizer Handle

B Power Bay Units

C Base or Core PCIX Units

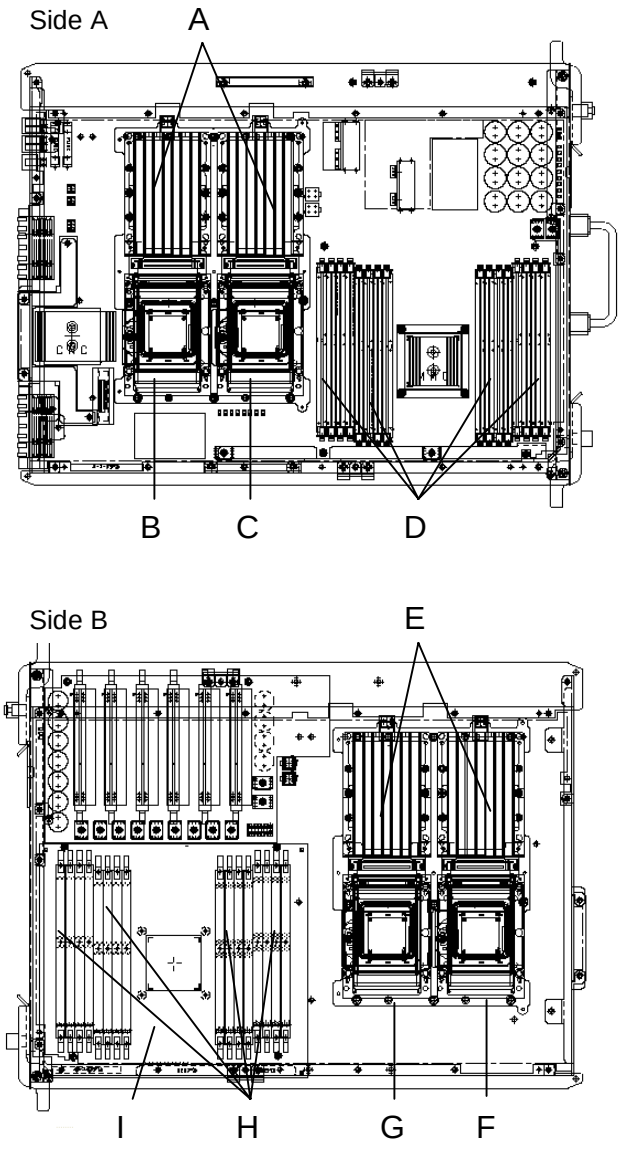
Note: Maximum Configuration shown.

Figure 1-4. I/O Expansion Cabinet Configuration



A	PCI Expansion Slots	D	Bay for DAT Tape Drive or USB FDD
B	PCI Expansion Slot Cover	E	Hard Disk Drive Bays (behind panel)
C	DVD-ROM Drive (Core Unit)		

Figure 1-5. PCIX Unit Features



A	Power Pods	F	CPU Slot #0
B	CPU Slot #1	G	CPU Slot #2
C	CPU Slot #3	H	DIMM Slots
D	DIMM Slots	I	Memory Daughter Board
E	Power Pods		

Figure 1-6. CELL Board Features

Main Components

The following sections provide information about server components.

Itanium 2 Processors

Depending on system configuration, your system uses Intel Itanium 2 64-bit 1.3-GHz/3-MB or 1.5-GHz/6-MB processors. Four Intel Itanium 2 processors are installed within one Cell Board. See Figure 1-6.

Up to 4 Cell Boards with a total of up to 16 CPUs can be installed in the 16-way server (1160Xd) and up to 8 Cell Boards with a total of up to 32 CPUs can be installed in the 32-way server (1320Xd). All processors installed in your system must be of identical bus and core speed.

System Memory

Each Cell Board in your system contains sixteen 168-pin DIMM sockets on the Cell Board and another sixteen DIMM sockets on the Cell Board daughterboard. See Figure 1-6. Memory DIMMs must be populated four at a time with 1-GB ECC SDRAM DIMMs. Depending on the number and capacity of DIMMs installed, each Cell Board can include from 4 GB up to 32 GB of memory using 1-GB DIMMs.

The 16-way server (1160Xd)supports up to 128 GB of memory using 1-GB DIMMs. The 32-way server (1320Xd) supports up to 256 GB of memory using 1-GB DIMMs.

XBC Board

The XBC Board consists of one Cross-Bar Controller (XBC). You can connect this board with up to 4 Cell Boards to perform data transfer among Cell Boards. In a standard configuration, a 16-way server has 2 XBC Boards and a 32-way server has 4 XBC Boards – however, the system configuration you have might vary.

PCIX Unit

The server's PCIX Unit expansion capabilities meet the needs of file and application servers for high performance I/O by providing 14 hot-swap PCI-X expansion slots.

The PCI-X slots allow PCI-X boards to be installed or removed while the server is powered on (if the operating system supports the Hot Plug PCI function). A Basic I/O Board supporting the standard I/O interface and a video VGA controller board are installed in the Core Unit model. The Basic I/O Board and video VGA board are not hot-swappable.

> ***Note:*** Your operating system must support the Hot Plug PCI function.

Installation of a board in a particular slot and with other boards can determine the actual operating frequency of a board within a bus group. See Chapter 5, “I/O Board Installation” for information about installing a board in a particular slot for optimum operation.

A DVD-ROM drive is installed in the Core Unit as standard equipment. Optionally, a DAT tape drive or USB FDD and up to 6 disk storage hard disk drives may be added to the PCIX Unit. See Figure 1-5.

Service Processor Board

The Service Processor Board (iSP Board) controls power and monitors status of all components (see Figure 1-2 and 1-3). The board uses a PowerPC chip as the processor for iSP, memory, LAN, and serial interface functionality. The Service Processor Board performs initialization of the system, RAS functions, diagnostic functions, and failure management of the system.

The 16-way and 32-way servers each have two Service Processor Boards (one for redundancy).

Clock Boards

The 16-way and 32-way servers each have two Clock Boards for clock generation and distribution. One of the Clock Boards provides redundancy.

Power Bay Unit

Up to 6 Distributed Power Supply Modules can be installed in each Power Bay Unit. Power Bay Units can be installed as follows:

- 16-Way Server – one unit is installed in the main cabinet; two units can be installed for AC redundancy.
- 32-Way Server – two units are installed in the main cabinet; three units can be installed for AC redundancy.
- I/O Expansion Cabinet – one unit is installed in the cabinet; two units can be installed for AC redundancy.

System Functions

The following subsections describe select system functions.

Partitioning

The Express5800/1000 series server can run more than one operating system or instances of an operating system in the same main cabinet. For example, a configuration containing 4 Cell Boards (Cells hereafter), Cell #0, Cell #1, Cell #2, and Cell #3, can operate as follows:

- Cell #0 and Cell #1can operate under the same operating system #0 as an SMP (symmetric multi processor) configuration.
- Cell #2 can operate under operating system #1, which is different from Cell #0, Cell #1, and Cell #3.
- Similarly, Cell #3 can operate under operating system #2, which is different from Cell #0, Cell #1, and Cell #3.

Here, the Cell group which operates under the same operating system is called a partition. In the example below, Cell #0 and Cell #1 can be Partition #0, Cell #2 can be Partition #1, and Cell #3 can be Partition #2.

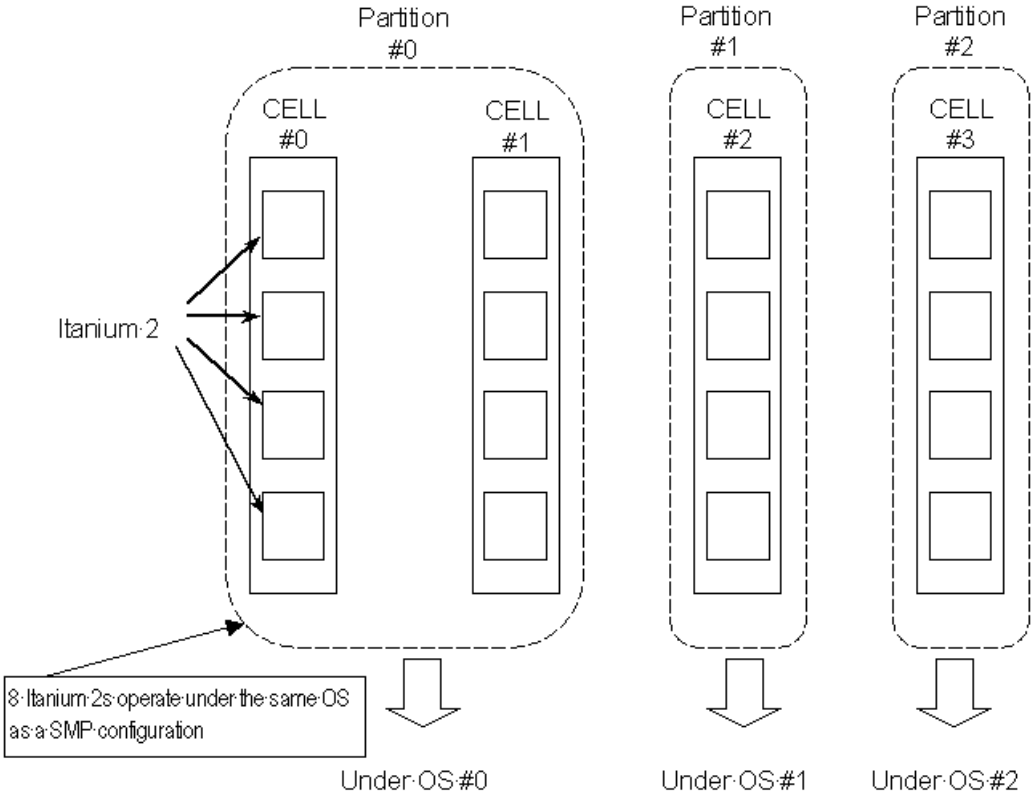


Figure 1-7. Example of Partitioning Cells

Partitioning makes it possible to allocate processor capacity according to workload status, resulting in flexible system operation.

Each partition is physically isolated by the hardware settings; a software error does not affect the other partitions. Thus the system can maintain high security.

Each partition consists of a Cell Board and a core PCIX unit. Multiple OS instances can run on different partitions independently. If a partition has at least one PCIX unit with basic I/O, the Cell Boards and the PCIX units can be flexibly assigned to any partition. Even if a failure occurs in a Cell Board, the system can disable the failed Cell Board and reboot the partition by reassigning a spare Cell Board. This feature minimizes partition down time.

The Service Processor manages the partitioning settings and configuration changes. You can change the partition configuration in the main cabinet by using the CC command in the SP command mode (see Chapter 3).

Chipset and Crossbar Switch

NEC developed a high-performance chipset and crossbar switch that is based on supercomputer mainframe technology. The crossbar switch connects the Cell Boards The crossbar switch has a low latency as well as high data bandwidth. While comprising Cache Coherent Non-Uniform Memory Access (cc-NUMA) architecture, the system employs the chipset and crossbar switch technology in achieving near uniform high-speed memory access.

Server Management

The Service Processor supports many management functions compatible to the Advanced Configuration and Power Interface (ACPI) and Intelligent Platform Management Interface (IPMI).

The system supports the following ACPI features:

- Configuration information tables interface from a platform.
- Software power off controls, etc.

The Service Processor also works as a management controller defined in IPMI. It supports the following IPMI features.

- Provides Field Replaceable Unit (FRU) information to System Management Services (SMS) running on the operating system.
- Monitors system power, fan speed, and temperature conditions.
- Monitors stall occurrences during the power-up sequence, OS loading, and normal running using a watchdog timer, etc.

The Service Processor provides the following management features:

- Error handling (error monitoring, logging, diagnostics, and reporting)
- System reset
- System configuration management
- Firmware update, etc.

The SMS running on a PC can control the above functions using the Service Processor's system management LAN port, which can support TELNET, FTP, and SNMP protocol. With the combination of the Service Processor and the SystemGlobe/GlobalMaster software, the Express 5800/1000 series supports automatic reconfiguration of partitions based on the conditions pre-defined in the SystemGlobe/GlobalMaster.

Expansion

The Express5800/1000 series server can be expanded by adding:

- Memory
- I/O boards
- Cell boards
- Disk drives
- PCIX Expansion Units.

See Figures 1-8 and 1-9 for diagrams of the Express5800/1160Xd and Express5800/1320 system configurations. See the following sections for a description of system expansion capabilities.

⚠ CAUTION

Contact qualified personnel, such as your System Administrator or an NEC Technician, for adding or removing server components.

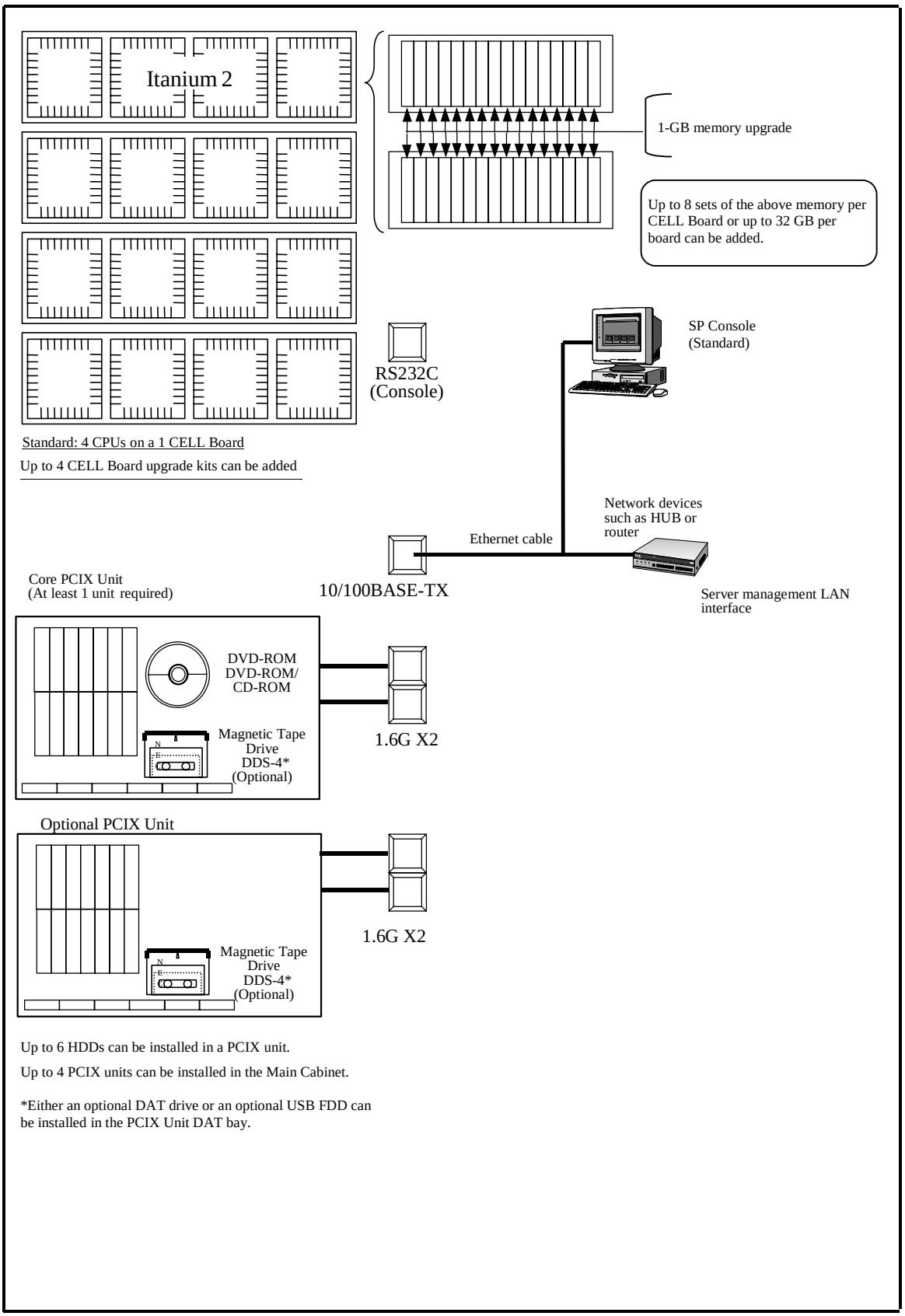

Itanium 2
1-GB memory upgrade
Up to 8 sets of the above memory per CELL Board or up to 32 GB per board can be added.
RS232C
(Console)
SP Console
(Standard)
Standard: 4 CPUs on a 1 CELL Board
Up to 4 CELL Board upgrade kits can be added
Network devices such as HUB or router
Ethernet cable
10/100BASE-TX
Server management LAN interface
Core PCIX Unit
(At least 1 unit required)
DVD-ROM
DVD-ROM/
CD-ROM
Magnetic Tape Drive
DDS-4*
(Optional)
1.6G X2
Optional PCIX Unit
Magnetic Tape Drive
DDS-4*
(Optional)
1.6G X2
Up to 6 HDDs can be installed in a PCIX unit.
Up to 4 PCIX units can be installed in the Main Cabinet.
*Either an optional DAT drive or an optional USB FDD can be installed in the PCIX Unit DAT bay.

Figure 1-8. Express5800/1160Xd 16-Way System Configuration

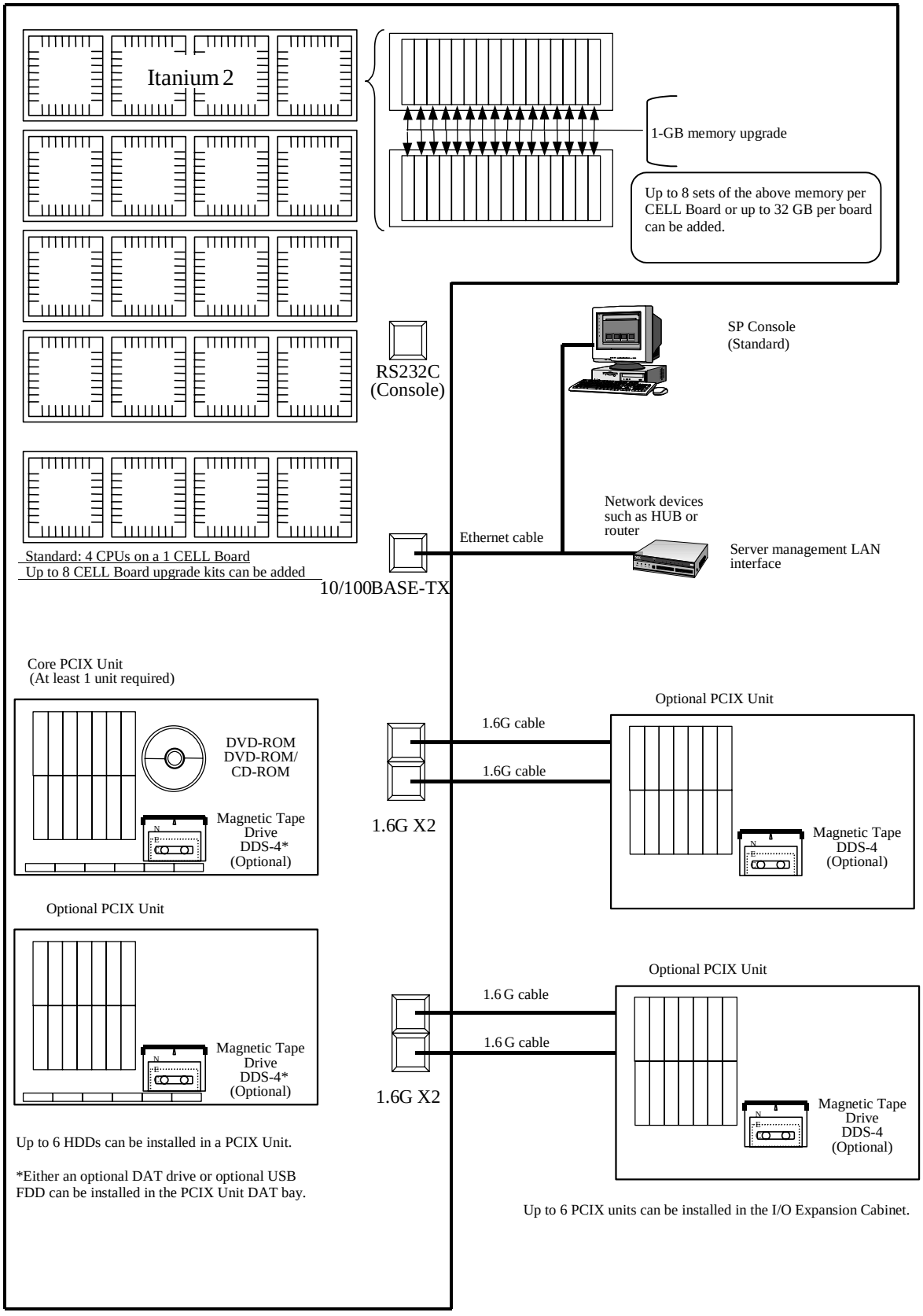

Itanium 2
1-GB memory upgrade
Up to 8 sets of the above memory per CELL Board or up to 32 GB per board can be added.
RS232C (Console)
SP Console (Standard)
Network devices such as HUB or router
Ethernet cable
Server management LAN interface
10/100BASE-TX
Standard: 4 CPUs on a 1 CELL Board
Up to 8 CELL Board upgrade kits can be added
Core PCIX Unit
(At least 1 unit required)
DVD-ROM
DVD-ROM/
CD-ROM
Magnetic Tape Drive
DDS-4*
(Optional)
1.6G cable
1.6G cable
1.6G X2
Optional PCIX Unit
Magnetic Tape
DDS-4
(Optional)
Optional PCIX Unit
Magnetic Tape Drive
DDS-4*
(Optional)
1.6 G cable
1.6 G cable
1.6G X2
Optional PCIX Unit
Magnetic Tape Drive
DDS-4
(Optional)
Up to 6 HDDs can be installed in a PCIX Unit.
*Either an optional DAT drive or optional USB FDD can be installed in the PCIX Unit DAT bay.
Up to 6 PCIX units can be installed in the I/O Expansion Cabinet.

Figure 1-9. Express5800/1320Xd 32-Way System Configuration

CAUTION

Contact qualified personnel, such as your System Administrator or an NEC Technician, for adding or removing server components.

Cell Board

Each Cell Board supports:

- 4 Intel Itanium 2 processors
- 32 DIMMs (16 on the Cell Board, 16 on the Cell Board daughterboard).

The 16-way server supports up to 4 Cell Boards for a total of 16 Itanium 2 processors and up to 32 DIMMs per board.

The 32-way server supports up to 8 Cell Boards for a total of 32 Itanium 2 processors and up to 32 DIMMs per board.

CPUs

Each Cell Board supports 4 Itanium 2 processors. The system supports the following processor types:

- Intel Itanium 2 1.3GHz/3MB of level 3 cache
- Intel Itanium 2 1.5GHz/6MB of level 3 cache

The same type processor must be used in the system. The two types cannot be mixed within a single system.

Memory

Each Cell Board with memory daughterboard supports up to 32 DIMMs (16 on the Cell Board, 16 on the daughterboard) in the following configurations:

- Memory must be installed in groups of 4 DIMMs of the same capacity.
- Memory capacity can vary between different groups
- At least one group of four DIMMs is required in the system.
- Each Cell Board supports up to 4 groups of 4 DIMMs; each memory daughterboard supports up to 4 groups of 4 DIMMs.
- A memory groups includes four 1-GB DDR DIMMs for total capacity of 4 GB in a group.
- Maximum memory capacity using currently available 1-GB DIMMs is 32 GB per Cell Board with memory daughterboard.

For detailed memory configuration information, see Appendix B. in this guide.

Optional PCIX Unit

At least one PCIX Unit is required in a 16-way and 32-way server configuration. PCIX Units can be added as follows:

- Up to 4 PCIX Units can be added to the 16-way Main Cabinet.
- Up to 2 PCIX Units can be added to the 32-way Main Cabinet.
- Up to 6 PCIX Units can be added to the I/O Expansion Cabinet for the 32-way system..

The PCIX Unit connects to the system via a 1.6-GB interface cable (dedicated cable for connecting the unit).

Power Bay Unit

Up to six Distributed Power Supply (DPS) modules can be installed in a Power Bay Unit.

Power Bay Units can be installed as follows:

- 16-way server (1160Xd) – one Power Bay Unit can be installed; two units are required for redundancy.
- 32-way server (1320Xd) – one or two Power Bay Units can be installed; two units are required for redundancy.
- I/O Expansion Cabinet – one unit can be installed; two units are required for redundancy.

Peripheral Devices

Disk drives can connect to a SCSI board, and ATA devices can connect to the Basic I/O Board. You can also connect peripheral devices via PCI cards installed in the PCIX Unit.

Security

To help prevent unauthorized entry or use of the system, the server provides the following security features:

- Locked areas require a security key for entry. Locked areas include the front and rear Main Cabinet doors.
- The BIOS Setup utility provides user and administrative password security, protecting the system from unauthorized operation.
- Console operation requires the entry of login authentication with a login account and password.

2

System Operation

- Setting Up the Server
- Starting Up the System
- Shutting Down the System
- Using Exception Procedures
- Reviewing Firmware Operations
- Booting the OS
- Using the DVD-ROM Drive
- Using an Optional Tape Drive

Setting Up the Server

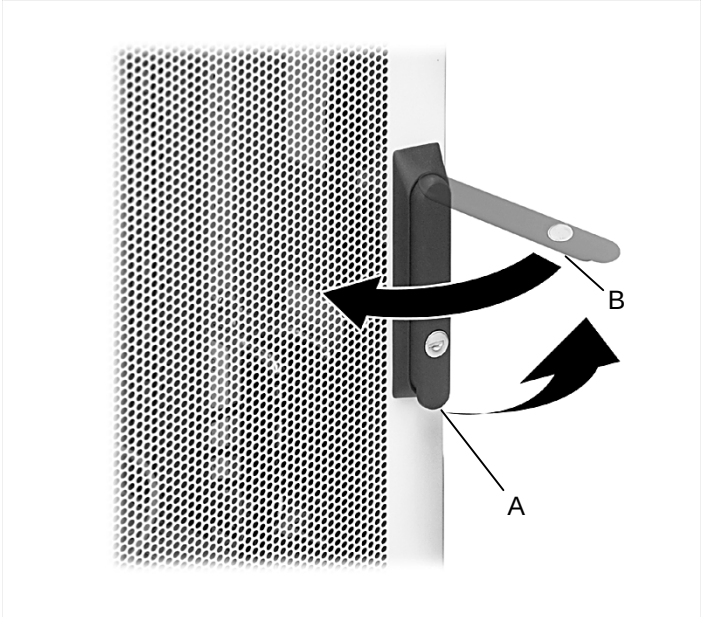
Use the following procedure to set up the server.

> ***Note:*** See Chapter 1 of this user's guide to become familiar with server features, such as the location of system switches, indicators, and main chassis components.

1. Check that the server has been installed as described in the *Express5800/1080Xd/1160Xd/1320Xd Site Preparation Guide* and *Express5800/1160Xd/1320Xd Installation Procedures*. This server requires installation by qualified personnel such as an NEC technician and system administrator.
2. Make sure that any optional components other than I/O cards or boards, have been installed by an NEC technician.

   If you have an I/O card or board to install, install it now (see Chapter 5, "I/O Board Installation").
3. Unlock the rear door of the server with the security key. Open the door by lifting the handle and turning it clockwise (see Figure 2-1).

   Server cable connectors for system setup are located at the rear of the server.



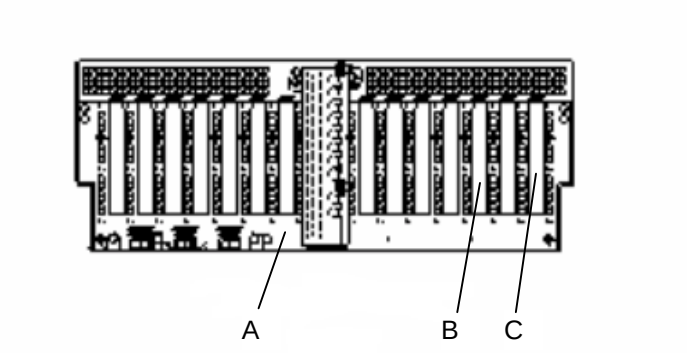
A Lift Handle
B Turn Clockwise

Figure 2-1. Opening the Server Door

4. Locate the server LAN cable at the rear of the server cabinet. Connect a client PC to the server LAN connection.

> ***Note:*** A LAN cable either comes already connected to the Service Processor board or it is connected by the NEC technician during the server installation.

5. Connect peripheral devices, such as a monitor, mouse, and keyboard, to the rear of the server. Video and I/O board connectors are at the rear of the PCIX Unit. See Figure 2-2 for typical connector locations.



A	Rear of PCIX Unit
B	Slot with VGA Monitor Board
C	Slot with I/O Board Mouse and Keyboard Connectors

Figure 2-2. Video Board and I/O Board Connector Locations

> **⚠ CAUTION**
>
> When connecting a cable to an I/O board, be sure to leave enough cable free for sliding the PCIX unit out of the cabinet. Route the cable so it does not get pinched or damaged.
>
> Route the external device cables under the rear door frame and out of the way of the rear server door.

6. Close and lock the rear server door.

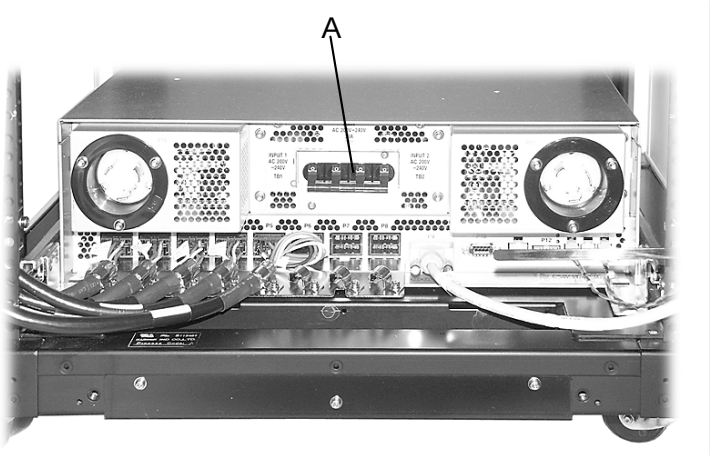
Starting Up the System

Start up the server system as follows.

1. Make sure all external devices, such as the console, keyboard, and mouse have been connected, and the power cords are connected (see the previous section, “Setting Up the Server”).
2. Turn on the circuit breaker or main switch to the system power source.

> ***Note:*** If the server power cord is connected to a power control unit such as an UPS (Uninterruptive Power Supply), make sure that the power control unit is powered on.

3. Power on the console and any other external devices. Check that they start up without any errors.
4. At the bottom rear of the server cabinet, turn on the AC power circuit breaker for Power Bay Unit 0 and for Power Bay Unit 1 (see Figure 2-3).



A AC Power Circuit Breaker

Figure 2-3. AC Power Circuit Breaker

> ***Note:*** If the AC-Link function has been enabled, following the AC power breaker being turned on, and if the operating system has been installed, the system will automatically boot up the operating system without further intervention (refer to the description of the SU command in the Express5800/1160Xd/1320Xd Service Guide).
>
> If the AC-Link function has not been enabled, then continue with this “Starting Up the System” procedure.

5. Press **Esc** on the service processor (SP) keyboard. The iSP (service processor) login prompt appears.
6. Enter the login name **spfw** and password **nec**. (The login name and password are default values.) The iSP Main Menu screen appears (see Figure 2-4).
7. At the iSPyz prompt, enter the iSP command **s** to enter the SP command mode.
8. Press **Esc**.

```
Integrated Service Processor.
Cabinet-ID:xx, Location:y, State:ssssss

iSP login: spfw<ENTER>
iSP password: xxxxxxxx<ENTER>

Copyright (C) 2002 NEC Corporation, All Rights Reserved.
Welcome to Integrated Service Processor.
     iSP FW version : 01.00 generated on 01/31/2002 19:20:33

iSP MAIN MENU
     0) OS(BIOS) serial console of partition#0 (INITIALIZING)
     1) OS(BIOS) serial console of partition#1 (RUNNING)
     2) OS(BIOS) serial console of partition#2 (STOPPED)
     3) OS(BIOS) serial console of partition#3 (FAULT)
     4) OS(BIOS) serial console of partition#4 (POWER OFF)
     5) OS(BIOS) serial console of partition#5 (RUNNING)
     V) Virtual System Operator Panel
     S) iSP commands
     E) Exit

iSPyz> s
***** SP Command Mode                                  ****
***** enter ESC to do the command input effectively    *****
***** enter CTRL+B to quit                             *****

iSPyz:--->
```

Figure 2-4. SP Console Screen – SP Firmware Activated

9. Enter **up** on the SP console to bring up the specified partitions (see Figure 2-5).

The service processor turns on power to the specified partitions, initializes the hardware, and hands off the control to the BIOS. The BIOS boots the operating system.

```
iSPyz:--->  up<ENTER>
This command will bring up the specified partition.

Enter partition number (0-7/all/CR=exit) : all<ENTER>
Execute OK? (y/[n]) y<ENTER>
UP command was accepted. All partitions will run soon.

[iSPyz:INFO.ccc] partition 0 : power on sequence started.
[iSPyz:INFO.ccc] partition 1 : power on sequence started.
            :
[iSPyz:INFO.ccc] partition 1 : power on sequence completed normally.
            :
[iSPys:INFO.ccc] partition 1 : handed off the control to BIOS.
```

Figure 2-5. System Startup Screen

Shutting Down the System

Shut down the system as follows.

1. Select a method to shut down the system:

> ***Note:*** If supported by your operating system, Windows Shut Down is the recommended method of shutting down the system.

- **Recommended shutdown** – Windows Shut Down **(**if supported by the operating system):
  Shut down the operating system (OS). The related partition(s) automatically shuts down and powers off (see Figure 2-6).

- Shutdown using the DN command.
  Enter **dn** on the SP console to shut down the system. If software is not running, this command powers off the selected partition(s) (see Figure 2-7).

- Shutdown system power using the DF command:
  Enter **df** on the SP console to force a shut down of the system (see Figure 2-8). This power shutdown method forces a partition shutdown without prior warning to the operating system.

> **⚠ CAUTION**
> This SP command (df) turns off system power regardless of OS or BIOS operation and without notifying either. This command corresponds to a power button override function of a system with a physical power button.

```
[iSPyz:INFO.ccc] partition 0 : power off sequence started.
                 :
                 :
                 :
[iSPyz:INFO.ccc] partition 0 : power off sequence completed normally.
```

Figure 2-6. OS Shut Down Screen

```
iSPyz:--->  dn<ENTER>
System power will be turned off if the software (OS) is NOT running.
Only power button interrupt will be generated if the software (OS) is running.
If you want to turn off the system power in any system state, use DF command.

Enter partition number (0-7/all/CR=exit) : all<ENTER>
Execute OK? (y/[n]) y<ENTER>
DN command was accepted. System power of all partitions will be turned off or
power button interrupt will be generated soon.

[iSPyz:INFO.ccc] partition 0 : power button interrupt.
[iSPyz:INFO.ccc] partition 1 : power button interrupt.
[iSPyz:INFO.ccc] partition 2 : power off sequence started.
            :
[iSPyz:INFO.ccc] partition 2 : power off sequence completed normally.
```

Figure 2-7. DN Command Power Shut Down Screen

```
iSPyz:---> df<ENTER>
CAUTION: System power will be turned off without any notice to the softwares
even if they are running.

Enter partition number (0-7/all/CR=exit) : all<ENTER>
Execute OK? (y/[n]) y<ENTER>
DF command was accepted. System power of all partitions will be turned off soon.

[iSPyz:INFO.ccc] partition 0 : power off sequence started.
[iSPyz:INFO.ccc] partition 1 : power off sequence started.
            :
            :
            :
[iSPyz:INFO.ccc] partition 1 : power off sequence completed normally.
```

Figure 2-8. DF Command Power Shut Down Screen

2. Check that the DC power is off. The SP console displays a “power off” message (see Figures 2-6, 2-7, and 2-8).

This is a normal system “power off.” For a complete system power off, perform the following steps.

> ***Note:*** The following steps perform a “complete system power off.” A “complete power off” is not normally performed.

3. Power off the console.
4. At the rear of the system, turn off the Power Bay Unit circuit breakers (see Figure 2-3).
5. Power off peripheral devices not powered by the server.
6. Power off the main circuit breaker or power distribution board.

> ***Note:*** If the server power cord is connected to a power control unit such as an UPS (Uninterruptible Power Supply), refer to the UPS user's guide for proper power-off procedures.

Using Exception Procedures

The following sections describe exception procedures for restarting the system.

> ***Note:*** For detailed information about SP commands, see "SP Command Reference" in Chapter 3.

Dump

Use the dump function to request the operating system to perform its memory dump process. You can select either to restart or not to restart using the operating system settings. To use the dump function, the system must be running the operating system.

To dump, enter **dp** at the SP command prompt.

Cold Reset

Use a cold reset to reset the entire system, including memory, when there is a hardware error condition.

Perform a cold reset as follows:

1. Stop the operating system.
2. Enter **rs** at the SP command prompt.

Restart

Perform a system restart as follows:

1. Stop the operating system.
2. Enter **pc** at the SP command prompt.

Power On Reset

Perform a power on reset as follows:

1. Stop the operating system.
2. Enter **dn** at the SP command prompt. Check that the main chassis fans stop rotating.
3. At the rear of the system, turn off the Power Bay Unit circuit breakers (see Figure 2-3).
4. Wait 10 to 15 seconds to discharge residual voltage.
5. Turn on the AC power circuit breaker for Power Bay Unit 0 and for Power Bay Unit 1(see Figure 2-3).
6. On the SP console, enter the login account and password.
7. On the SP console, enter **up** at the SP command prompt. The service processor turns on DC power and initializes the hardware. The BIOS boots the operating system.

Reviewing Firmware Operations

The following sections describe the firmware (FW) operations that take place before the operating system starts up.

Startup Triggers

The following triggers make the firmware perform the operations preceding the startup of the operating system:

- DC On – Startup of the system.
- Dump – Collection of log information and restart of system. (You can select either to restart or not to restart the system using the operating system settings.)
- Cold Reset – Reset of the entire system including memory from software or due to a hardware error.

SP FW

When a system startup is triggered, the service processor firmware (SP FW) operations include:

1. AC On – Self-test.
2. DC ON/Dump/Cold Reset
   - Hardware check 1 – Hardware check for the power supply capacity test.
   - Power supply capacity test
   - Hardware check 2 – Hardware check for checking the minimum configuration.
   - Hardware self-test
   - Hardware initialization
   - Memory scan (memory test)
   - BIOS transfer

BIOS Transfer/OS Loading

BIOS transfer operations include:

1. Itanium® 2 Processor self-test
2. Itanium 2 Processor initialization
3. Loading of OS loader – loads the operating system.

Booting the OS

The following sections include information about the EFI Boot Manager, EFI shell, shell commands, and booting the OS from the EFI shell.

OS Boot from Boot Manager

The EFI Boot Manager automatically starts after a BIOS bootup (see Figure 2-9). From the EFI Boot Manager, you can choose to go to:

- EFI applications
- EFI shell prompt
- Boot maintenance menu.

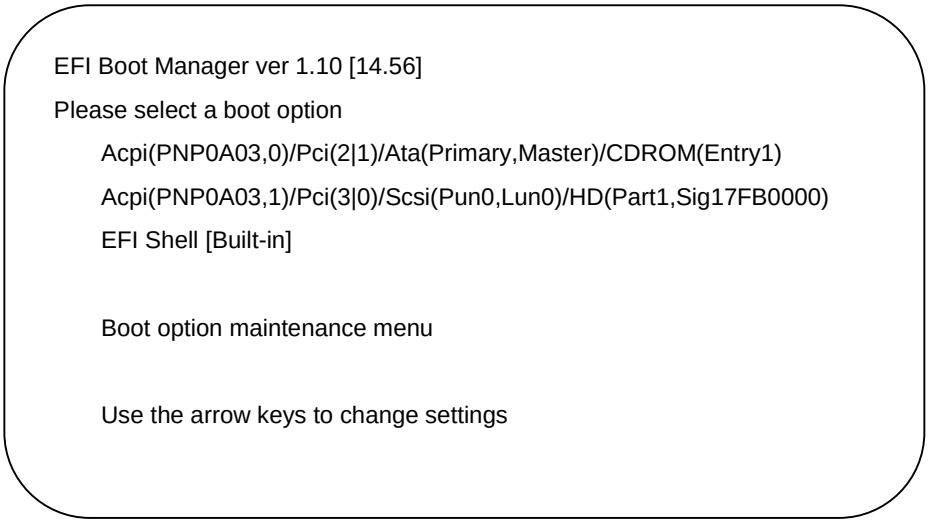


Figure 2-9. EFI Boot Manager Screen

OS Boot from the EFI Boot Manager

When the OS is installed, OS boot options are automatically registered in the EFI Boot Manager. You can select and boot the OS from the EFI Boot Manager.

Figure 2-10 shows an example of a boot path defined "Acpi(PNP0A03,0)/Pci(3|0)/Scsi(Pun0,Lun0)/HD(Part1,Sig17FB0000)" as the OS boot disk.

To boot the OS from the EFI Boot Manager, select the boot path using arrow keys and press **Enter**.

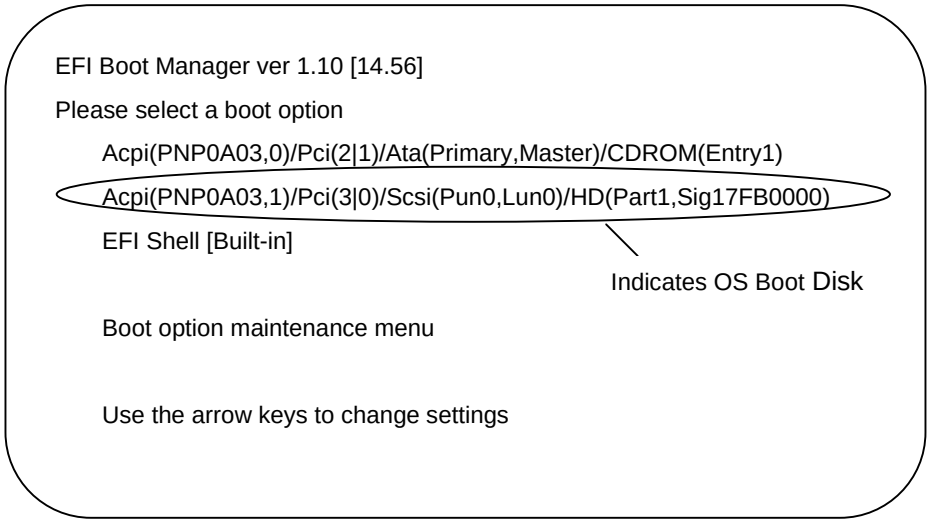


Figure 2-10. OS Boot from EFI Boot Manager Screen

EFI Shell

From the EFI Boot Manager, you can activate the EFI shell. Use the EFI shell to:

- Read the system file of the Boot device.
- Copy files.

When you select the EFI Shell from the EFI Boot Manager, the EFI Shell screen appears (see Figure 2-11).

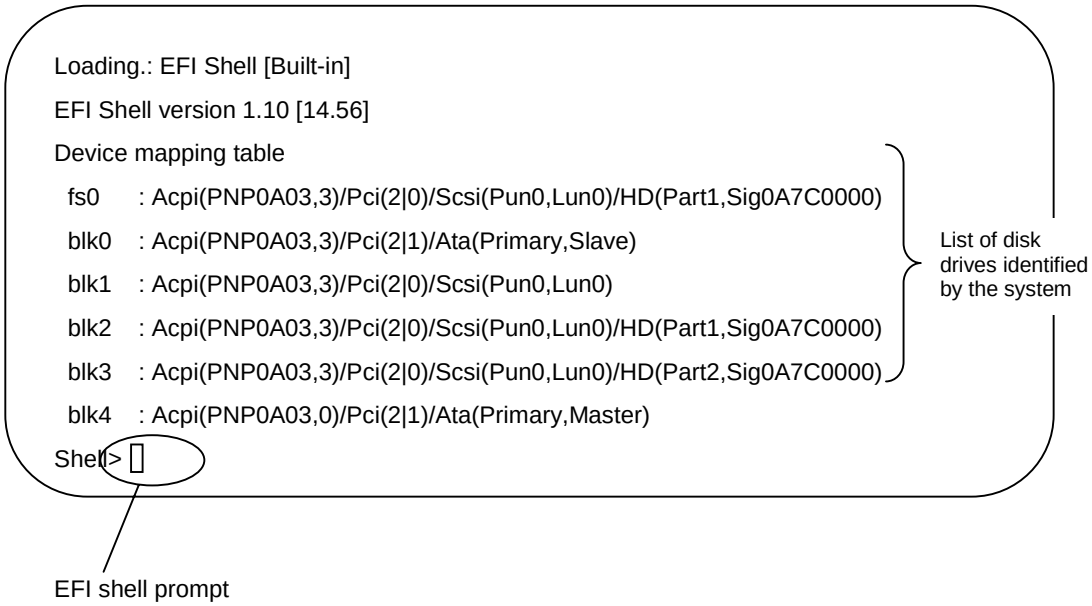


Figure 2-11. EFI Shell Screen

EFI Shell Commands

The following table lists and describes the shell commands in the EFI shell.

To execute an EFI shell command, enter the EFI shell command at the EFI shell prompt and press **Enter**.

Table 2-1. EFI Shell Commands

Command		Description
alias	alias [-d|-v|-b] [sname] [value]	Displays, creates, and deletes the alias definition in the EFI Shell environment.
attrib	attrib [+a|-a] [+s|-s] [+h|-h] [+r|-r] [-b] [file ...] [directory ...]	Displays and changes the attributes of the file/directory.
bcfg	bcfg driver|boot [dump –v] [add # file “desc”] [rm #] [mv # #]	Displays and changes the configuration of the driver/boot.
break	break	Executes a debugger breakpoint.
cd	cd [path]	Displays and changes the current directory.
child	child Handle	Displays the device tree under the handle.
cls	cls [color]	Clears the standard output.
comp	comp file1 file2	Compares the contents of the two files.
connect	connect [-r] Handle# | DeviceHandle# DriverHandle#	Binds the driver to the device and starts the driver.
cp	cp [-r] src [src ...] [dst]	Copies the file/directory.
date	date [mm/dd[yy]yy]	Displays and sets the date.
dblk	dblk device [Lba] [blocks]	Dumps the block device.
dh	dh [-p prot_id] [-b] | [handle]	Displays the handle in the EFI environment.
disconnect	disconnect DeviceHandle# [DriverHandle# [ChildHandle#]] | [-r]	Disconnects the device and the driver.
Dmem	dmem [Address] [Size] [;MMIO]	Dumps memory.
dmpstore	dmpstore	Displays the NVRAM variable.
echo	echo [-on|-off] echo [message]	Displays messages, or switches on/off echo.
edit	edit [file]	Edits the ASCII/UNICODE file.
EfiCompress	EfiCompress [InFile] [OutFile]	Compresses the file.
EfiDecompress	EfiDecompress [InFile] [OutFile]	Decompresses the file.
err	err [ErrorLevel]	Displays and changes the error level.
exit	exit	Exit from the EFI Shell.
getmtc	getmtc	Displays the current counter value.
guid	guid [-b]	Displays the GUID in the EFI environment.

Table 2-1. EFI Shell Commands (continued)

Command		Description
help	help [-b] | [cmd]	Displays the help information.
hexedit	hexedit [[-f] FileName | [-d DiskName Offset Size] | [-m Offset Size]	Edits in hexadecimal mode.
load	load file [file ...]	Loads the EFI driver.
LoadPciRom	LoadPciRom [FileName]	Loads the PCI option ROM image from the file.
ls	ls [-b] [-r] [-a [attrib]] [file]	Displays the directory/file list.
map	map [-r|-v|-d] [sname] [handle] [-b]	Displays and defines the mapping information.
memmap	memmap [-b]	Displays the memory map.
mkdir	mkdir dir [dir ...]	Creates a directory.
mm	mm Address [Width 1|2|4|8] [;MMIO| ; MEM| ; IO | ;PCI] [:Value] [-n]	Displays and changes MEM/IO/PCI.
mode	mode [row col]	Displays and changes the mode of the console output device.
mount	mount BlkDevice [sname]	Mounts the file system on the block device.
mv	mv src [src ...] [dst]	Moves the file/directory.
OpenInfo	OpenInfo Handle	Displays the protocol of the handle/agent.
pause	pause	Displays a message and waits for input.
pci	pci [Bus Dev [Func] [-i] [-s [Seg]]]	Displays the configuration space of the PCI device.
reset	reset [-w [string]]	Resets the system.
rm	rm [-q] file [file ...] rm [-q] directory [directory ...]	Deletes the file/directory.
set	set [-d|-v|-b] [sname [value]]	Displays, creates, changes, and deletes the EFI environment variable.
setsize	setsize newsize file	Sets the file size.
stall	stall microseconds	Stalls the processor in units of microseconds.
time	time [hh:mm[:ss]]	Displays the current time or sets the time.
touch	touch [-r] filename	Sets the current date/time to the date/time attribute of the file.
type	type [-a|-u] [-b] file [file ...]	Displays the content of the file.
unload	unload [-n] [-v] HandleIndex	Unloads the protocol image.
ver	ver	Displays the version information.

OS Boot from EFI Shell

You can boot the OS from the EFI Boot Manager. You can also boot the OS by entering commands from the EFI Shell.

An example follows for booting the OS from the SCSI hard disk drive in a hardware configuration containing:

- IDE DVD-ROM (Master)
- SCSI HDD: OS boot disk
- External LAN card built into the Expansion PCI slot.

> ***Note:*** Cards are available if they are supported by the application programs or OS.

1. Specify the file system. Change the current file system to the file system with the connected boot device by entering the device at the Shell prompt.

   For the example in the following screen (see Figure 2-12), enter **fs0:** for the fs0 boot device.

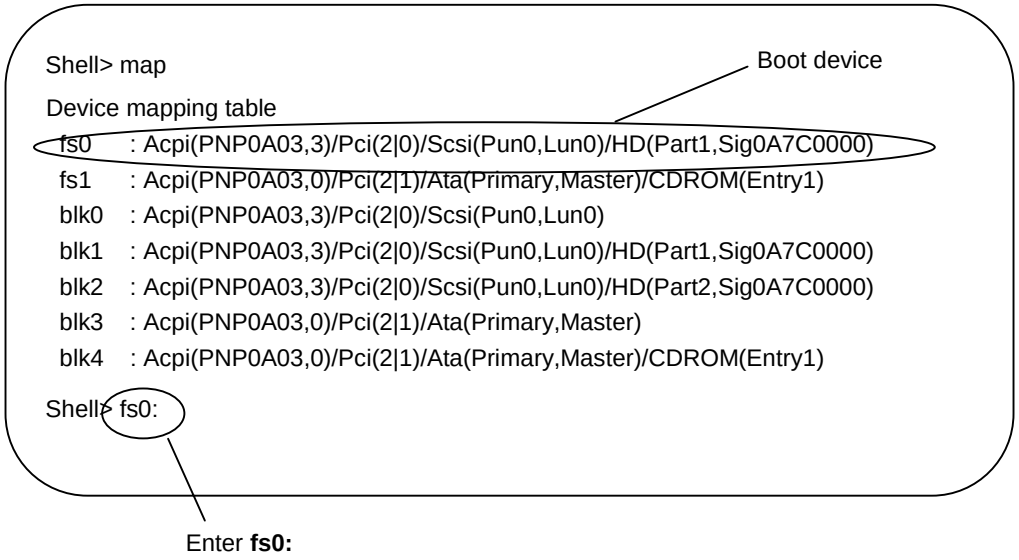


Figure 2-12. Specifying the File System on the Shell Screen

2. Change the current working directory to the directory in which the OS loader is stored.

   For example, enter **cd os** and press **Enter** at the Fs0:\ prompt.

3. At the fs0:\os prompt, enter **ls** and press **Enter** to display a directory list of files (see the following Figure 2-13). The list includes the OS loader file name.

4. Start the OS loader by entering the directory file name, in this example, **setupldr.efi**, at the fs0:\os prompt and press **Enter**.

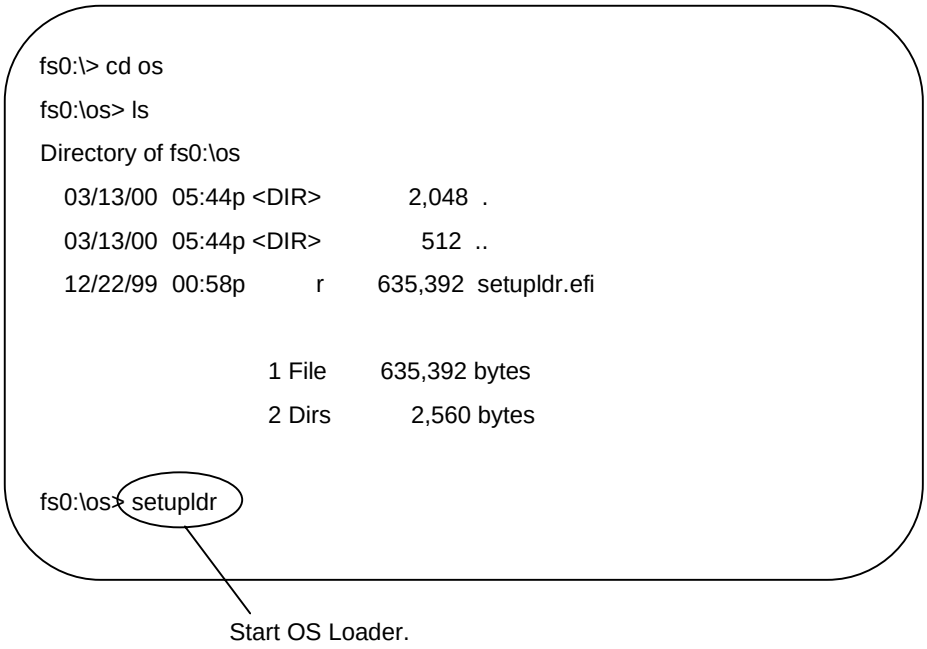


Figure 2-13. Starting the OS Loader from Shell

Notes for OS Installation

See the following notes requiring attention when installing the OS:

- Adding a SCSI card to a free slot and connecting a disk to the SCSI card after the OS installation, might change the numbering of the disk and prevent an OS boot from that disk.
- PCI14 slot is set to not run the Option ROM BIOS as default. Running the Option ROM BIOS on the PCI114 slot requires changing the settings of the slot with BIOS setup before booting the OS.

EFI Device Path

Each device installed in the system is managed with an "EFI Device Path." The following information describes EFI device paths.

See the following examples and Table 2-2 for device path formats for devices conforming to EDD3.0 specification:

Example: SCSI cards and disks installed on the PCI bus:

Acpi(PNP0A03, 1)/Pci(2|0)/Scsi(Pun0,Lun0)/HD(Part1,SigFF050000)

Example: DVD-ROM device connected to the IDE Secondary channel:

Acpi(PNP0A03,0)/Pci(2|1)/Ata(Secondary,Master)/CDROM(Entry1)

Table 2-2. Formats Conforming to EDD3.0 Specification

Path Display	Description
Acpi(PNP0A03, X)	Indicates that the device is installed under the PCI host bus. X: PCI host bus bridge number (starting with 0).
Pci(D|F)	Indicates PCI installation information of the device. D: PCI device number (Device numbers 2 – 5 correspond to slot numbers 1 – 4.) F: PCI function number.
Scsi(Pun0,Lun0)	Installation location of the SCSI device (disk) connected to the SCSI card.
HD(Part1,SigFF050000)	SCSI disk drive information.

See the following example and Table 2-3 for device path formats for devices that do NOT conform to EDD3.0 specification:

Example: SCSI cards and fixed disks installed on the PCI bus:

VenHw(Unknown Device:80)/HD(Part1,Sig6D5319DE)

Table 2-3. Formats for Devices Not Conforming to EDD3.0 Specification

Path Display	Description
VenHw(Unknown Device:80)	Example: The device does not conform to EDD3.0 specification. 80: a consecutive number (called a drive number) assigned to the disk under the SCSI card by the system BIOS. The drive numbers are as follows: 80 or higher: fixed disk drive 9F: DVD-ROM drive
HD(Part1,Sig6D5319DE)	SCSI disk drive information.

Checking Failure

When a failure is detected in the system, it can be checked in the Virtual System Operator Panel (SOP) on the SP console. Virtual SOP provides the following information:

- Partition configuration of the system
- Failure information.

For more information about Virtual SOP, see “Virtual SOP” in Chapter 3.

Using the DVD-ROM Drive

A DVD-ROM drive comes standard in the core PCIX Unit.

The DVD-ROM drive supports DVD-ROM and CD-ROM media.

See the following sections for information about using DVD-ROM or CD-ROM discs in the DVD-ROM drive.

⚠ WARNING

Take care when inserting and removing DVD-ROM media. To prevent injury, keep hands away from the tray when ejecting or inserting the tray.

Inserting a Disc in the DVD-ROM Drive

Insert a DVD-ROM or CD-ROM disc in the DVD-ROM drive as follows (see Figure 2-14).

1. Open the server door.
2. Press the Eject button on the DVD-ROM drive to eject the drive tray.
3. Place the disc on the tray, label facing up.
4. Press the Eject button on the DVD-ROM drive to insert the tray.

Removing a Disc from the DVD-ROM Drive

Remove a DVD-ROM or CD-ROM disc from the DVD-ROM drive as follows (see Figure 2-14)

1. Open the server door.
2. Check that the drive access LED (orange) is off.
3. Press the Eject button on the DVD-ROM drive to eject the tray.
4. Remove the disc.
5. Press the Eject button on the DVD-ROM drive to insert the tray.

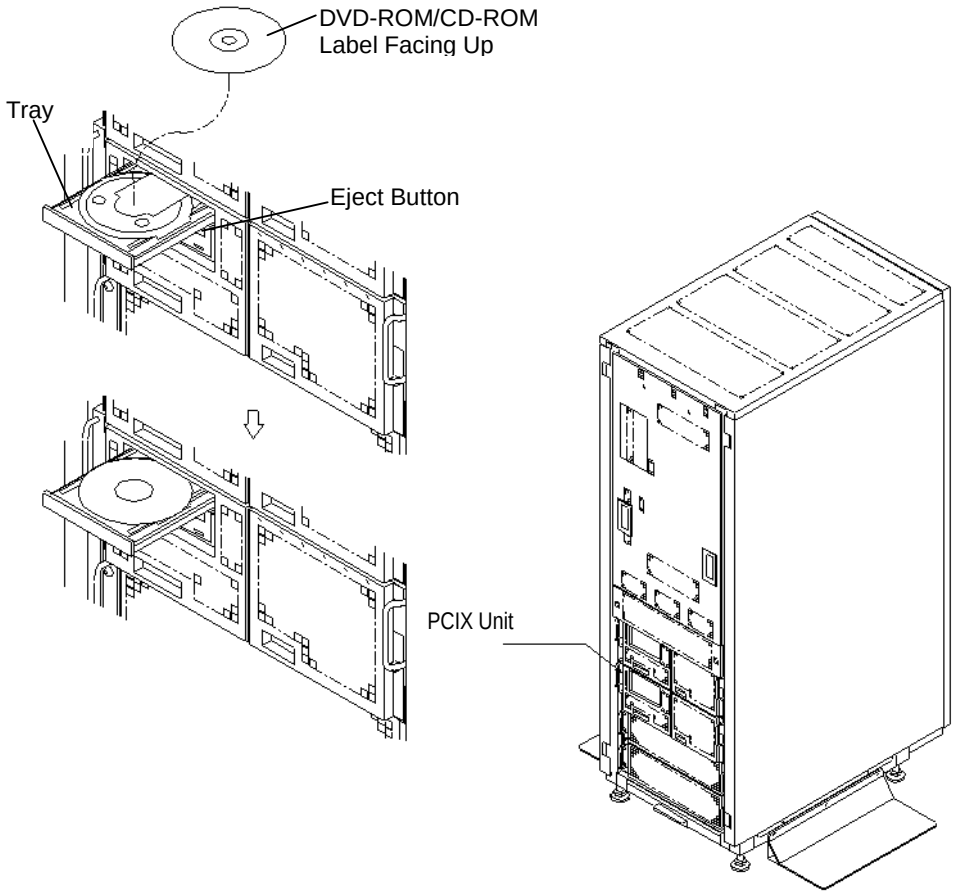


Figure 2-14. Inserting/Removing a DVD-ROM/CD-ROM Disc

Using an Optional Tape Drive

You can add an optional digital audio tape (DAT) drive to the PCIX Unit. See the following sections for information about:

- environmental DAT specifications
- DAT cartridge labels
- write protection
- cartridge insertion and removal.

Environmental DAT Specifications

The following information provides environmental conditions for using 4-mm digital audio tape in the DAT drive.

Operating Environment:

- Temperature: 41 to 89.6°F (5 to 32°C)
- Humidity: 20 to 60%, no condensation
- Maximum wet bulb humidity: 78.8°F (26°C)

Storage Environment:

- Temperature: 41 to 113°F (5 to 45°C)
- Humidity: 20 to 80%, no condensation
- Maximum wet bulb humidity: 78.8°F (26°C)

DAT Cartridge Labels

Use the following labeling information:

- Place labels securely on the DAT cartridge in the position shown in Figure 2-15. Be sure to write the start date of DAT cartridge use on the attached Index label.
- If you need to change the contents for the DAT, replace the label with a new one. (Do not erase the label contents.) Be sure to remove the old label before attaching the new label.
- If you use a label other than the specified INDEX label, be sure the label size is correct, the label can be easily replaced, and the label doesn't leave adhesive after removal.

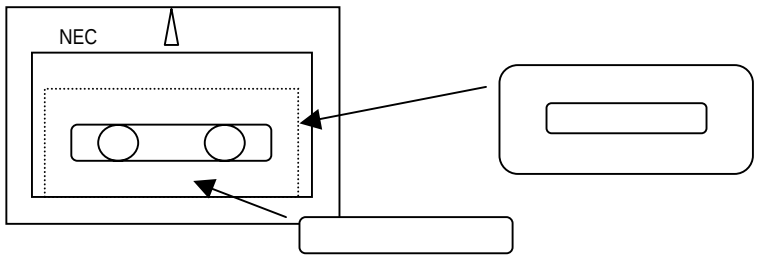


Figure 2-15. Digital Audio Tape Label Positions

Write Protection

You can protect written data on the audio digital tape from being erased. To protect the data, open the write protect slider on the label side of the digital audio tape cartridge (see Figure 2-16).

To write or overwrite data on the digital audio tape, close the write protect slider.

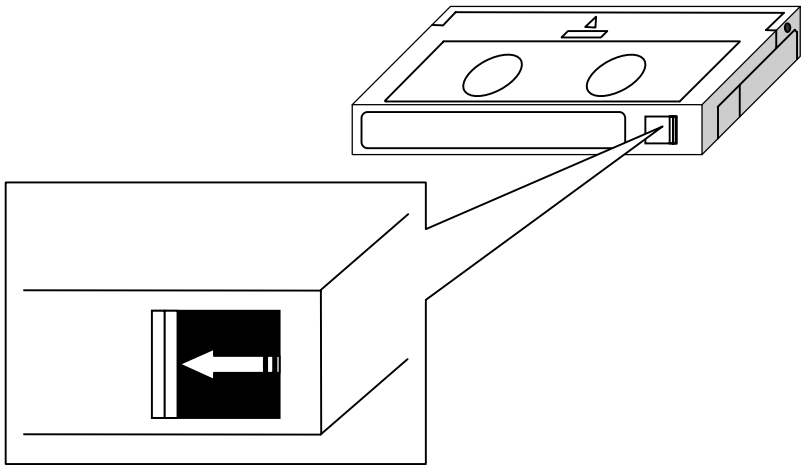


Figure 2-16. Write Protection Slider on the DAT Cartridge

DAT Cartridge Insertion and Removal

Use the following information to insert and remove DAT cartridges (see Figure 2-17).

- To insert a DAT cartridge:
  Hold the DAT cartridge horizontally, with the label side up, and insert it slowly into the drive until it is pulled into the drive.
- To remove a DAT cartridge:
  Check that the access LED on the DAT drive is off (green). Press the eject button on the DAT drive and carefully remove the cartridge.

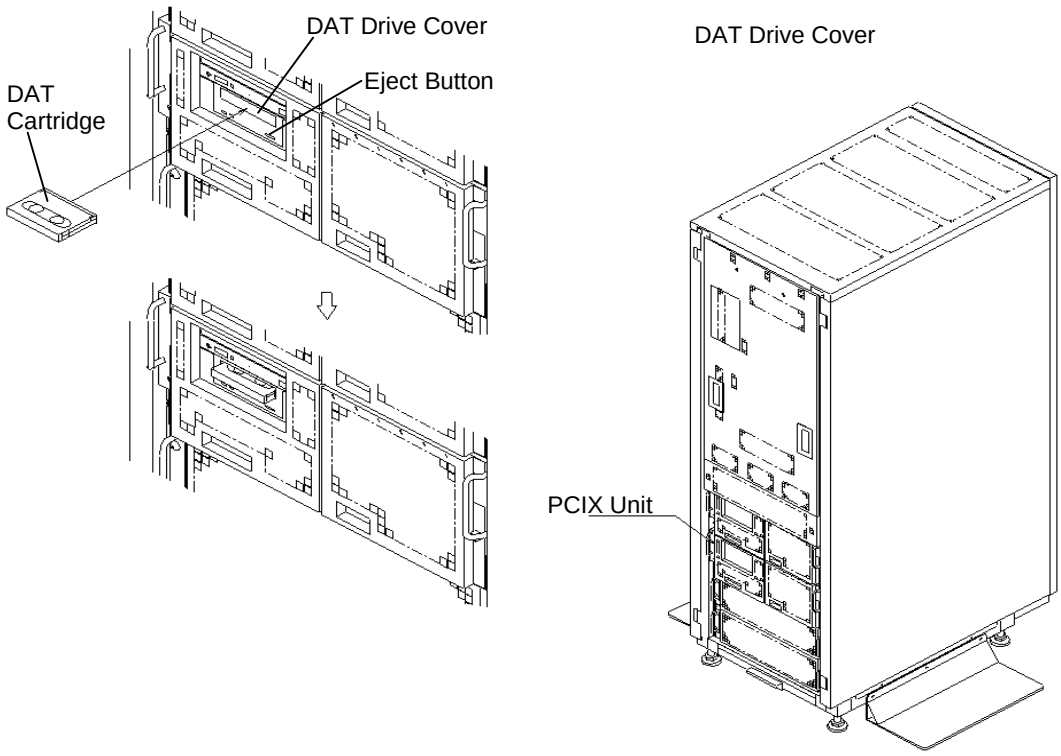


Figure 2-17. Inserting and Removing a DAT Cartridge

3

Service Processor

- SP Console
- OS Console
- Virtual SOP
- SP Command Console
- SP Command Reference

SP Console

The service processor (SP) in the Express5800/1000 series server provides the interface for system management and RAS functions. The SP is on the service processor (iSP) board.

The following sections describe:

- SP console connections
- Console operations
- Console status and login authentication
- Login and Main Menu.

SP Console Connections

The service processor supports two types of console connections (see Figure 3-1):

- serial (local console)
- LAN via TCP port 5001 (LAN console).

Both serial and LAN console connections provide the same operation. However, the LAN console requires an initial configuration which can only be done using the local console. See Table 3-1 for console configuration settings.

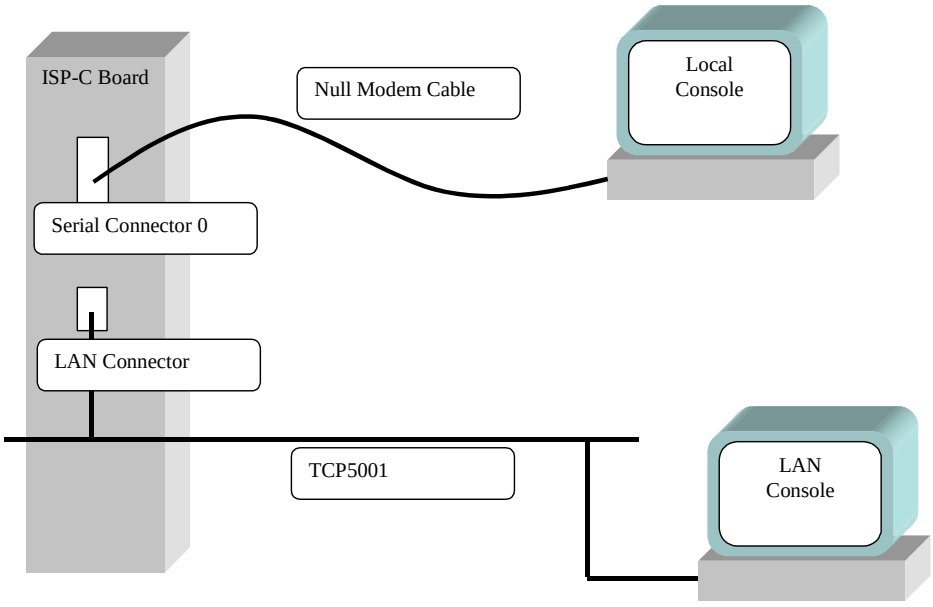


Figure 3-1. Express5800/1000 Series Console Connection

Table 3-1. Console Configuration Settings

Console Type	Configuration Item	Default Settings
Serial	Baud rate	9600
	Data bit length	8
	STOP bit length	1
	Parity bit	None
	Flow control	RTS/CTS
LAN	TCP port (Do not use 21, 23. They are for factory use.)	5001
	IP address	10.1.1.1
	Subnet mask	255.255.255.0
	Gateway IP address	N/A

Note: The most effective connection method between the Express5800/1000 Series and the Service Processor is by using a telnet utility. Multiple instances of the telnet utility can be running at once, providing multiple windows with which to monitor and control the system. These utilities also provide logging features, which can be very useful in back-tracking system settings and status reports. Be sure to set VT100 emulation mode.

Console Operations

You can use the consoles to:

- Operate the service processor using SP commands
- Redirect the operating system (BIOS) serial console (in main chassis)
- Display the Virtual SOP (Virtual System Operator Panel).

Console Status and Login Authentication

To use the consoles, you must first log into the service processor. When you log into the service processor, the iSP Main Menu appears.

From the iSP Main Menu, you can switch to one of the following functions:

- Virtual SOP – displays the system operating state for each partition with periodic updates.
- OS Console – redirects the serial input/output for the operating system (including BIOS).
- SP Command Console – allows you to monitor service processor output messages required for system operation and maintenance and to enter commands for the service processor. The SP Command Console lets you run commands required for system operation.

Table 3-2 lists the login account and login password default values for entering the Main Menu and using menu functions.

Table 3-2. Login Account and Password Defaults

Login Type	Defaults
Login Account	spfw
Login Password	nec

Note: Only one connection to the OS Console per partition, up to five connections to the Virtual SOP in the entire system, and only one prime connection to the SP Command Console in the entire system can be made simultaneously. If LAN is used, additional SP Command Consoles can be attached using hubs, but they will be in monitor mode only, and commands can be entered only via the prime connection.

See Figure 3-2 for a diagram of using console modes.

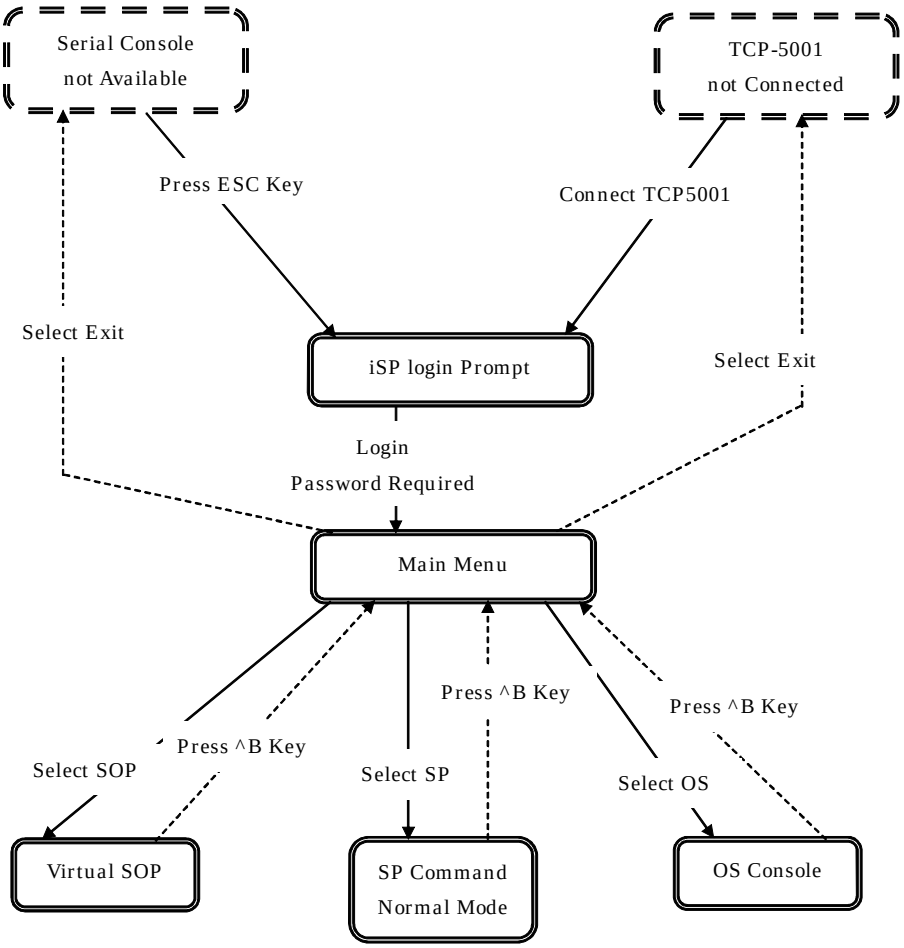


Figure 3-2. Express5800/1000 Series Console Mode Operations

Login and Main Menu

The initial state of a console connected to the service processor is the login wait state with the login prompt displayed. When you enter the login account and password, the iSP Main Menu appears.

The characters you enter for the login account and password are case-sensitive. However, alphabetic characters you enter in the Main Menu are not case-sensitive. For example, the lowercase letter “e” and the uppercase letter “E” are processed the same.

Table 3-3. Login and Main Menu Screen

Screen Image	Reference
Integrated Service Processor. Cabinet-ID:xx, Location:y, State:ssssss	A
iSP login: spfw<*ENTER*> iSP password: xxxxxxxx<*ENTER*>	B
Copyright (C) 2002 NEC Corporation, All Rights Reserved. Welcome to Integrated Service Processor. iSP FW version : 01.00 generated on 01/31/2002 19:20:33	C
iSP MAIN MENU 0) OS(BIOS) serial console of partition#0 (INITIALIZING) 1) OS(BIOS) serial console of partition#1 (RUNNING) 2) OS(BIOS) serial console of partition#2 (STOPPED) 3) OS(BIOS) serial console of partition#3 (FAULT) 4) OS(BIOS) serial console of partition#4 (POWER OFF) 5) OS(BIOS) serial console of partition#5 (RUNNING) 6) OS(BIOS) serial console of partition#6 (NOT CONFIGURED) 7) OS(BIOS) serial console of partition#7 (NOT CONFIGURED) V) Virtual System Operator Panel S) iSP commands E) Exit DISCONNECTALL) disconnect all console connections	D
iSPyz>	E

Table 3-4. Login and Main Menu Screen References

Reference	Description
A	“xx “is the ID for identification of a cabinet in a system composed of multiple cabinets. “y” indicates the installation location of the iSP board with 0 or 1. “ssssss” becomes “master” if operating as the master, “backup” if operating as the backup, or “undetermined “ if determination of master/backup has not been done.
B	Entry for login account and password. The password is not displayed.
C	Displays the version information of iSPFW, initial diagnosis program, and built-in dictionary (BID) for failure analysis.
D	Displays the Main Menu options. The OS Console menu displays only the configured partitions (to which at least 1 cell is built in using the HC command). OS Console and Virtual SOP are displayed by iSP operating as the master. In the OS Console menu, the summary state of the partitions is also displayed.
E	Displays the iSP Main Menu selection prompt. “y” indicates the installation location of the iSP board with 0 or 1. “z” becomes “m” if operating as the master, “b” if operating as the backup, or “u” if determination of master/backup has not been done.

Table 3-5. Main Menu Login Events and Operations

Event	Operation
The account or password is invalid.	Displays “incorrect” and then displays the login prompt again.
The account or password is invalid three times in a row.	Disconnects the session.
Left for 5 minutes in login or password prompt state.	Displays “timeout” and then disconnects the session.
A character not on the menu is entered.	Displays the menu again.
Left for 5 minutes in menu display state.	Displays “timeout” and then disconnects the session.
A switch of the iSP master occurs while the menu is displayed, making the menu invalid.	Changes are not immediately reflected in the menu display and prompt. When you select an invalid menu, the selection is ignored and a new menu is displayed.
0 – 7 selected. (Only those of the master iSP are valid)	Switches to the OS (BIOS) serial console redirection.
S selected. (Valid regardless of master/backup)	Switches to the SP Command Console.
V selected. (Valid only in the master iSP)	Switches to the Virtual SOP.
E selected.	Disconnects the session.
DISCONNECTALL selected.	Disconnects all connections with iSP except the connection under operation. This operation occurs only in special situations (such as the case where a connection with the service processor was actually disconnected but remains under service processor management due to irregular access of a client to the service processor; as a result, any further operation cannot be performed). After a DISCONNECTALL is selected, authentication with Maintenance Mode is performed.
The number of simultaneous connections allowed for the selected menu is exceeded.	Displays “N connections to the selected mode are already established. Try it later.” Displays the Main Menu again.

OS (BIOS) Console

When you select the OS (BIOS) Console on the iSP Main Menu, input/output is redirected to the OS (BIOS) serial controller.

To return to the Main Menu, press **^B** (CTRL+B).

The image displayed and the operation during redirection depend on the BIOS and OS running in the partition; they are therefore not recognized by the service processor firmware (iSPFW).

OS (BIOS) Console redirection is available only on the master iSP.

Table 3-6. OS (BIOS) Console Operation

Screen Image	Reference
iSP MAIN MENU 0) OS(BIOS) serial console of partition#0 (INITIALIZING) 1) OS(BIOS) serial console of partition#1 (RUNNING) 2) OS(BIOS) serial console of partition#2 (STOPPED) 3) OS(BIOS) serial console of partition#3 (FAULT) 4) OS(BIOS) serial console of partition#4 (POWER OFF) 5) OS(BIOS) serial console of partition#5 (RUNNING) 6) OS(BIOS) serial console of partition#6 (NOT CONFIGURED) 7) OS(BIOS) serial console of partition#7 (NOT CONFIGURED) V) Virtual System Operator Panel S) iSP commands E) Exit DISCONNECTALL) disconnect all console connections	
iSPyz> 0<*ENTER*>	A
*****redirection of serial console 0 *****	B
*****enter CTRL+B to quit *****	
: : : : :	C
<*CTR*L>+<*B*>	D
*****returned from serial console 0 redirection *****	E

Table 3-7. Login and Main Menu Screen References

Reference	Description
A	When you enter 0-7, the menu is redirected to the OS Console of the corresponding partition.
B	The starting message of OS Console redirection is displayed.
C	":" is input and output during the OS Console redirection depend on the OS and BIOS.
D	Pressing ^B terminates the redirection of the OS Console.
E	A message is displayed to indicate the end of the redirection. Returns to Main Menu.

Table 3-8. OS (BIOS) Console Events and Operations

Event	Operation
^B (CTRL+B) is pressed.	Displays a message indicating the exit of the session from the OS (BIOS) Console and then returns to the Main Menu and prompt.
A switch of the iSP master occurs, making the OS (BIOS) Console invalid.	Displays a message indicating the exit of the session from the OS (BIOS) Console and then returns to the Main Menu and prompt.
The SP command deletes the displayed partition.	Displays a message indicating the exit of the session from the OS (BIOS) Console and then returns to the Main Menu and prompt.

Virtual SOP

When you select Virtual SOP (Virtual System Operator Panel) on the iSP Main Menu, Virtual SOP appears. The Virtual SOP periodically refreshes the display of the state of all the partitions.

To return to the Main Menu from the Virtual SOP, press **^B** (CTRL+B).

Virtual SOP is available only on the master iSP.

Table 3-9. Virtual SOP Screen

Screen Image	Reference
iSP MAIN MENU 0) OS(BIOS) serial console of partition#0 (INITIALIZING) 1) OS(BIOS) serial console of partition#1 (RUNNING) 2) OS(BIOS) serial console of partition#2 (STOPPED) 3) OS(BIOS) serial console of partition#3 (FAULT) 4) OS(BIOS) serial console of partition#4 (POWER OFF) 5) OS(BIOS) serial console of partition#5 (RUNNING) 6) OS(BIOS) serial console of partition#6 (NOT CONFIGURED) 7) OS(BIOS) serial console of partition#7 (NOT CONFIGURED) V) Virtual System Operator Panel S) iSP commands E) Exit DISCONNECTALL) disconnect all console connections	
iSPyz> V<*ENTER*>	A
----- Virtual System Operator Panel ---------- 01/31/2001,19:30:20 ----- xx 0 HW INITIALIZING yyyyyy xx 1 RUNNING yyyyyy BIOS messages BIOS messages SP messages SP messages xx 2 STOPPED yyyyyy xx 3 FAULT yyyyyy BIOS messages BIOS messages SP messages SP messages xx 4 POWER OFF yyyyyy xx 5 RUNNING yyyyyy BIOS messages BIOS messages SP messages SP messages xx 6 NOT CONFIGURED yyyyyy xx 7 NOT CONFIGURED yyyyyy BIOS messages BIOS messages SP messages SP messages ----- Enter CTRL+B to quit ----------	B
: : : : :	C
<*CTR*L>+<*B*>	D

Table 3-10. Virtual SOP Screen References

Reference	Description
A	When you enter “V,” the Virtual SOP appears.
B	Virtual SOP image is displayed.
C	The Virtual SOP is periodically displayed.
D	Pressing ^B terminates the Virtual SOP. Return to Main Menu.

Partition State Display

The state display for each partition is described in the following figure and table.

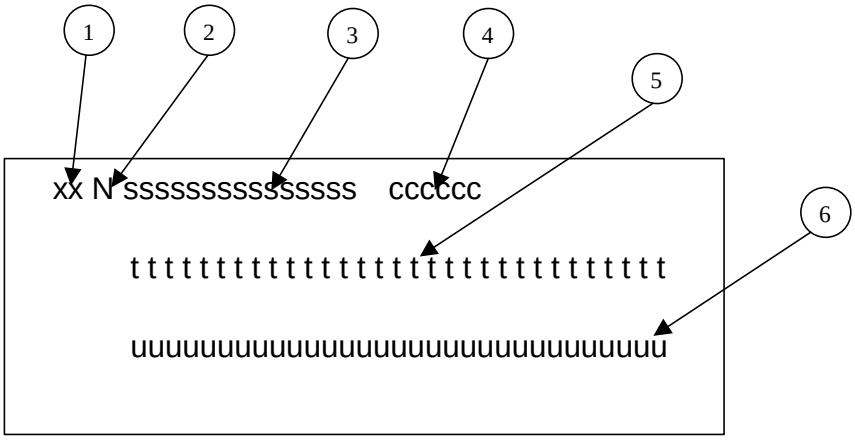


Figure 3-3. Partition State Display

Table 3-11. Reference to Partition State Display

Reference No.	Display	Description
1	Numeral	ID for identifying a cabinet in a super scalable cluster composed of multiple cabinets.
2	Numeral (0 – 7)	Partition number.
3	String	State of the partition.
	POWER OFF	DC OFF state.
	STOPPED	In DC ON state, has no failure, and is being stopped.
	HW INITIALIZING	ISP is initializing the hardware. The BIOS has not started yet.
	SW ININIALIZING	BIOS is initializing the system.
	OS BOOTING	OS booting is in progress.
	RUNNNG	BIOS has finished initialization of the system and the control has been passed to the EFI.

Table 3-11. Reference to Partition State Display (cont'd)

Reference No.	Display	Description
3 (cont'd)	FAULT	Indicates that the BIOS has finished initialization of the system and control has been passed to EFI.
	SHUT DOWN	iSP is shutting down the hardware.
	NOT CONFIGURED	Partition is not configured.
4	6-digit hexadecimal	Latest chassis code is sent from the BIOS or OS.
5	String	Displayed when any error code is sent from the BIOS. The code has 4 figures. For information about the code, see the BIOS section. Deleted at next system startup.
6	String	Displayed when any warning error message is sent from the SP. The message is similar to the activity log. When the message is long, the latter part of the message will be omitted. Deleted at next system startup.

SP Command Console

When you select the iSP commands on the iSP Main Menu, the SP Command Console appears. Initially, the SP Command Console is in Normal Mode for general operation. You can switch to Maintenance Mode (which allows all operations) by using the CM command.

To return to the Main Menu from the SP Command Console, press **^B** (CTRL+B).

Some SP commands function only on the master iSP.

Table 3-12. SP Command Console Operation

Screen Image	Reference
iSP MAIN MENU 0) OS(BIOS) serial console of partition#0 (INITIALIZING) 1) OS(BIOS) serial console of partition#1 (RUNNING) 2) OS(BIOS) serial console of partition#2 (STOPPED) 3) OS(BIOS) serial console of partition#3 (FAULT) 4) OS(BIOS) serial console of partition#4 (POWER OFF) 5) OS(BIOS) serial console of partition#5 (RUNNING) 6) OS(BIOS) serial console of partition#6 (NOT CONFIGURED) 7) OS(BIOS) serial console of partition#7 (NOT CONFIGURED) V) Virtual System Operator Panel S) iSP commands E) Exit DISCONNECTALL) disconnect all console connections	
iSPyz> S<*ENTER*>	A
: : :	B
: :	
<*CTR*L>+<*B*>	C

Table 3-13. SP Command Screen References

Reference	Description
A	When you enter S, the SP Command Console appears.
B	":" indicates the monitoring of the SP command input and SP message output.
C	Pressing ^B exits the session from the SP Command Console and returns to the Main Menu.

SP Command Console Buffer

SP Command Console output from the service processor might contain important information, such as the cause of a system state change. With the LAN console, however, you cannot monitor the console output from the end of iSP startup until the LAN console connection is established. Therefore, the iSP has a function to save a certain amount of message output in a buffer while the connection is being established to the SP Command Console. About 1,000 lines of messages can be stored in this buffer. The buffer stores the latest 1,000 lines of messages. You can use the ML command to view the messages stored in the buffer.

SP Command Prompt

In SP command mode (Normal Mode or Maintenance Mode), one of the following types of command prompt is displayed when you press the ESC key.

Interactive operations for each SP command and prompts for subcommand entry depend on the SP command.

Table 3-14. SP Command Mode Prompts

Prompt	Description
ISPyz:-->	Command prompt in Normal Mode.
ISPyz:MNT>	Command prompt in Maintenance Mode.

SP Message Header

SP messages have a header in the formats listed in the following table.

No message header is added to the prompts and messages that appear during interactive operations in each SP command.

Table 3-15. SP Message Header Formats

Message Header	Description
[iSPyz:INFO.cccc] string	Indicates an information message. “cccc” is the ID assigned to each message. “string” is the message body.
[iSPyz:WARN.cccc] string	Indicates a warning message.
[iSPyz:ERRORcccc] string	Indicates an error message.

SP Command List

The following table lists the SP commands by category.

Table 3-16. System Control Commands

CMD	Command Name	Function	NML Mode	MNT Mode	iSP State
DF	Shut Down System Power (override)	The iSP turns off the DC power of the specified partition without notifying the SW (OS) even if it is running.	X	X	m
DN	Shut Down System Power	If the specified partition is in SO state, the iSP only generates the SCI(POWBTN). Otherwise, the iSP turns off the DC power directly.	X	X	m
DP	System Dump	The iSP generates the INIT signal to the specified partition. SW(OS) will enter its dump routine.	X	X	m
PC	Power Cycle	The iSP turns off the DC power of the specified partition without notifying the SE(OS) even if it is running, turns on the DC power, initializes HW and hands off the control to the BIOS.	X	X	m
RS	Cold Reset System	The iSP initializes the specified partition without notifying the SW(OS) even if it is running.	X	X	m
UP	Bring Up System	The iSP turns on the DC power of the specified partition and initializes HW and hands off the control to the BIOS. The BIOS boots the operating system.	X	X	m

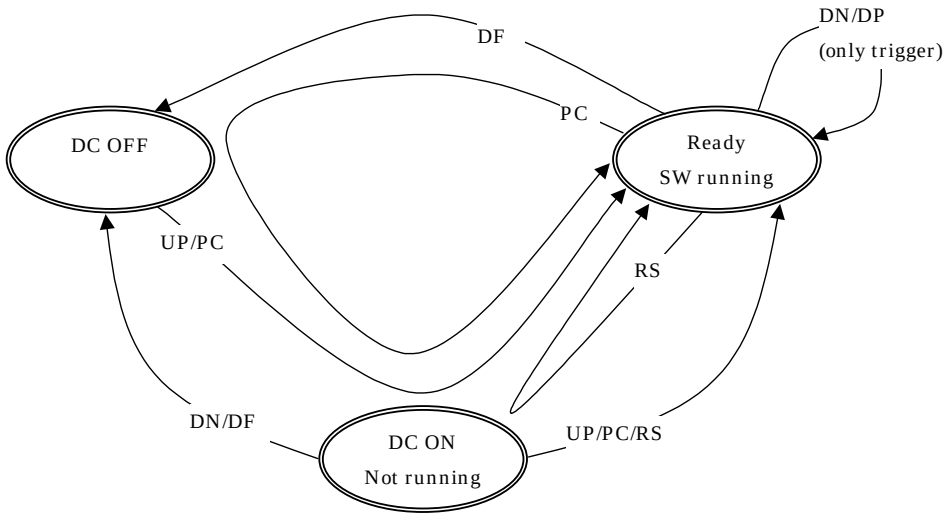


Figure 3-4. System State Transitions and System Control Commands

Table 3-17. Configuration Command

CMD	Command Name	Function	NML Mode	MNT Mode	iSP State
HC	Hardware Configuration	The iSP displays and/or modifies the hardware configuration, including partitions.	X	X	m

Table 3-18. Normal Mode Commands

CMD	Command Name	Function	NML Mode	MNT Mode	iSP State
CM	Change Command Mode	Enter into or exit from the maintenance mode.	X	X	m/b/u
DL	Display SP logs	Display the logs stored in iSP.	X	X	m/b/u
DT	SP Date and Time	Display the SP RTC (Real Time Clock) and set it.	X	X	m/b/u
EN	Environmental Information	Display the environmental information such as the power state and the temperature sensors.	X	X	m/b/u
FV	Firmware Version	Display the iSP FW version and BIOS version.	X	X	m/b/u
HE	Help	Display help information.	X	X	m/b/u
ML	Message Log	Display the iSP's message buffer.	X	X	m/b/u

SP Command Reference

The following sections provide detailed information about SP commands.

The description for each command lists whether the command can be executed in Normal or Maintenance mode, whether it can be executed in the master, backup, or undetermined iSP.

For example:

NML	MNT	m	b	u
X	X	X		

NML: "X" indicates that the command can be executed in Normal mode.

MNT: "X" indicates that the command can be executed in Maintenance mode.

m: "X" indicates that the command can be executed in the master iSP.

b: "X" indicates that the command can be executed in the backup iSP.

u: "X" indicates that the command can be executed in the undetermined (master or backup) iSP.

In the above example, the command can be executed in both the Normal mode and Maintenance mode only if the iSP is in the master state.

Basically, SP commands and subcommands are not case-sensitive. Any need for case-sensitivity (for example, accounts and passwords) is described.

CM (Change Command Mode)

NML	MNT	m	b	u
X	X	X	X	X

This command changes the command mode from Normal mode to Maintenance mode. Entering Maintenance mode requires the entry of a password.

Table 3-19. CM Command Screen

Screen Image	Reference
iSPyz:---> cm<*ENTER*> Password is needed to enter maintenance mode. maintenance password : xxxxxxxx <*ENTER*> incorrect. maintenance password : xxxxxxxx <*ENTER*> Command Mode was changed to maintenance mode.	 A B

Table 3-20. CM Screen References

Reference	Description
A	To switch from Normal mode to Maintenance mode, a password is required. If you enter a wrong password, a message is displayed and the system waits for another password entry. If you enter an incorrect password three times in a row, the command terminates. Passwords are case sensitive.
B	After the mode change to Maintenance mode is displayed, the command terminates.

DF (Shut Down System Power <override>)

NML	MNT	m	b	u
X	X	X		

This command turns off system power (DC).

The DF command turns off the system regardless of the operation state of the OS or BIOS and without notifying either. (This corresponds to the power button override function of a system that has a physical power button.)

Table 3-21. DF Screen

Screen Image	Reference
iSPyz:---> df<*ENTER*> CAUTION: System power will be turned off without any notice to the softwares even if they are running. Enter partition number (0-3/all/CR=exit) : all<*ENTER*> Execute OK? (y/[n]) y<*ENTER*> DF command was accepted. System power of all partitions will be turned off soon. [iSPyz:INFO.ccc] partition 0 : power off sequence started. [iSPyz:INFO.ccc] partition 1 : power off sequence started. : : : [iSPyz:INFO.ccc] partition 1 : power off sequence completed normally.	 A B C D

Table 3-22. DF Screen References

Reference	Description
A	Enter a partition number. If you select “all”, all the configured partitions become the targets.
B	Displays the confirmation message. To continue, enter “y”.
C	Displays the DF command acceptance message.
D	Displays the state of the process running in the background.

DL (Display SP Logs)

NML	MNT	m	b	u
X	X	X	X	X

This command displays the logs stored in the iSP. You can upload the logs as a file to an FTP server.

The logs are managed in two iSPs independently if the iSP is redundant. The logs are stored in the storage of the iSP operating as the master when the logs occurred and won't be transferred to the new master iSP if the master is changed.

Table 3-23. DL Screen

Screen Image	Reference
iSPyz:---> dl<*ENTER*> Log area status (03/01/2002 18:59:00 iSPFW R01.01): Type Entries Latest No. Earliest Latest ---------- --------- ---------- ---------- ---------- activity 1000 404 01/31/2002 12:24:50 02/29/2004 13:54:12 HW fatal 16 0 01/31/2002 12:24:50 02/29/2004 13:54:12 HW recoverable 64 32 01/31/2002 12:24:50 02/29/2004 13:54:12 processor MCA 128 20 01/31/2002 12:24:50 02/29/2004 13:54:12 processor CMC 64 2 01/31/2002 12:24:40 02/29/2004 13:54:12 processor INIT 64 1 01/31/2002 12:24:40 01/31/2002 13:54:12 system dump 8 7 01/31/2002 12:24:40 02/29/2004 13:54:12 iSP snapshot 8 3 02/29/2004 15:34:51 02/29/2004 13:54:12	A
Display or FTP upload the activity logs? (d[isplay]/f[tp]/CR=exit) : f<*ENTER*>	B
IP of FTP server [default=10.0.0.2] (CR=skip) : 10.0.0.3<*ENTER*> account [default=necuser] : necuser<*ENTER*> password [default=********] : xxxxxxxx<*ENTER*> file path : log/activity.log<*ENTER*> connecting... connected. uploaded.	C
Display or FTP upload? (d[isplay]/f[tp]/CR=back) : d<*ENTER*>	D
Filter logs by partition? (a[ll]/0-3/CR=back) : a<*ENTER*>	E

Table 3-23. DL Screen (cont'd)

Screen Image	Reference
Filter logs by category? a ... all 1 ... system control 7 ... fatal error 2 ... system configuration 8 ... recoverable error 3 ... BIOS event 9 ... dump event 4 ... IPMI SEL 11 ... proc. MCA event 5 ... system init. error 12 ... proc. INIT event 6 ... SP event 13 ... proc. CMC event (a/1-13/CR=back) : a<*ENTER*>	F
select display mode (i[nteractive per page]/a[ll]/CR=back) : i<*ENTER*>	G
1023 10:30:32,12/31/2002 part.0--- CONTROL system state S5. 1022 10:30:31,12/31/2002 part.0--- CONTROL timeout. (Shutdown WDT) 1021 10:29:31,12/31/2002 part.0--- CONTROL going to system state S5.	
1020 10:29:30,12/31/2002 part.0--- IPMISEL 01234567 89abcdef 01234567 89abcdef 1019 10:29:29,12/31/2002 part.0--- IPMI stop IPMI WDT. 1018 10:29:25,12/31/2002 part.0--- CONTROL POWBTN# asserted. 1017 10:20:00,12/31/2002 part.-1-- HR(012) ATT1(CELL2:Memory SBE, addr=0020304050607080, ROW25)	H
action? (h=help/CR=next) : h<*ENTER*> h : help r : refresh l : latest entry o : oldest entry p : previous page n : next page q : quit <nnnn> : jump to the entry which is numbered nnnn. <hh:mm:ss,MM/DD/YYYY> : search the first entry after specified time. d <nnnn> : display detailed log dump if present. a <nnnn> : display detailed log analysis if present. f <nnnn> : ftp detailed log data if present.	I
action? (h=help/CR=next) : d 1017<*ENTER*> ***** LOG DUMP START ***** : : : ***** LOG DUMP END ***** action? (h=help/CR=next) : a 1017<*ENTER*>	

Table 3-23. DL Screen (cont'd)

Screen Image	Reference
***** LOG ANALYSIS RESULT ***** : : : ***** LOG ANALYSIS END ***** action? (h=help/CR=next) : q<*ENTER*> Log area status (03/01/2002 18:59:00 iSPFW R01.01): Type Entries Latest No. Earliest Latest ---------- ---------- ---------- ---------- ---------- activity 1000 404 01/31/2002 12:24:50 02/29/2004 13:54:12 HW fatal 16 0 01/31/2002 12:24:50 02/29/2004 13:54:12 HW recoverable 64 32 01/31/2002 12:24:50 02/29/2004 13:54:12 processor MCA 128 20 01/31/2002 12:24:50 02/29/2004 13:54:12 processor CMC 64 2 01/31/2002 12:24:40 02/29/2004 13:54:12 processor INIT 64 1 01/31/2002 12:24:40 01/31/2002 13:54:12 system dump 8 7 01/31/2002 12:24:40 02/29/2004 13:54:12 iSP snapshot 8 3 02/29/2004 15:34:51 02/29/2004 13:54:12 Display or FTP upload the activity logs? (d[isplay]/f[tp]/CR=exit) : <*ENTER*> DL command terminated.	J

Table 3-24. DL Screen References

Reference	Description
A	On the DL command MENU, select "a".
B, D	Select whether to display all the activity logs or upload them to the FTP server. (Uploading detailed logs individually is described later.)
C	This is an example of uploading to the FTP server.
E	If you choose to display, select a partition number first. When you enter a partition number (0-7), only the events related to the partition can be displayed. (In this case, events common to the partitions are included in the display.) If you select "all", no filtering by partition number is done.
F	Select a category. You can display only the events of the specified category. If you select "all", no filtering by category is done.
G	Select to display all the events at the same time or to prompt you every 25 lines.
H	This is an example of activity logs.

Table 3-24. DL Screen References (cont'd

Reference	Description
I	If you enter "h" in response to "action?", Help for the action appears. If you specify an activity log number, you jump to the log number. If you specify the time, you jump to the oldest log after the specified time. The log with the display of "XXX log was collected." has a link to the detailed log. The operations listed below are available to the log: If you enter "d <nnnn>", hexadecimal dump output of the detailed log is done. If you enter "f <nnnn>", the detailed log is uploaded to the FTP server. If you enter "a <nnnn>", the result of the analysis of the detailed log with analyzing program is displayed. The detailed logs with program analysis are as follows: HW fatal, HW recoverable, processor MCA, iSP snapshot.
J	If you enter "q" in response to "action?", the display exits from the log display.

DN (Shut Down System Power)

NML	MNT	m	b	u
X	X	X		

This command turns off system power (DC). If software is not running (for example, in the S0 state), this command turns off the system.

If any software, such as the OS and BIOS, is running (for example, in the S0 state), this command only reports a power button interrupt to the software, and the process for the power button interrupt depends on the software. (The software may ignore the power button interrupt, or may perform a shutdown and turn off the power.)

Even if the iSP recognizes that some software is running, the software may not be able to process the power button interrupt due to stalling. In this case, use the DF command to force the system to turn off.

Table 3-25. DN Screen

Screen Image	Reference
iSPyz:---> dn<*ENTER*>	
System power will be turned off if the software (OS) is NOT running. Only power button interrupt will be generated if the software (OS) is running. If you want to turn off the system power in any system state, use DF command.	
Enter partition number (0-7/all/CR=exit) : all<*ENTER*>	A
Execute OK? (y/[n]) y<*ENTER*>	B
DN command was accepted. System power of all partitions will be turned off or power button interrupt will be generated soon.	C
[iSPyz:INFO.ccc] partition 0 : power button interrupt. [iSPyz:INFO.ccc] partition 1 : power button interrupt. [iSPyz:INFO.ccc] partition 2 : power off sequence started. : : : [iSPyz:INFO.ccc] partition 2 : power off sequence completed normally.	D

Table 3-26. DN Screen References

Reference	Description
A	Enter a partition number. If you select “all,” all configured partitions become the targets.
B	Displays the confirmation message. To continue, enter “y”.
C	Displays the command acceptance message. The actual process runs in the background.
D	Displays the state of the process running in the background.

DP (System Dump)

NML	MNT	m	b	u
X	X	X		

This command generates a dump interrupt in the system.

The actual operation of the dump processing and the following system reset depend on the software (OS or BIOS). This command only generates a dump interrupt.

Obviously, nothing happens if no software is running.

Table 3-27. DP Screen

Screen Image	Reference
iSPyz:---> dp<*ENTER*> Dump button interrupt will be generated. Enter partition number (0-7/all/CR=exit) : all<*ENTER*> Execute OK? (y/[n]) y<*ENTER*> DP command was accepted. Dump button interrupt will be generated soon. [iSPyz:INFO.ccc] partition 0 : dump button interrupt. [iSPyz:INFO.ccc] partition 1 : dump button interrupt. : : :	 A B C D

Table 3-28. DP Screen References

Reference	Description
A	Enter a partition number. If you select “all,” al configured partitions become the targets.
B	Displays the confirmation message. To continue, enter “y”.
C	Displays the command acceptance message. The actual process runs in the background.
D	Displays the state of the process running in the background.

DT (SP Date and Time)

NML	MNT	m	b	u
X	X	X	X	X

Displays and changes the time of the real-time clock built into the iSP.

This command only displays time in Normal Mode.

Table 3-29. DT Screen

Screen Image	Reference
iSPyz:---> dt<*ENTER*> current iSP RTC : 19:20:57,01/31/2002 +09:00 syncronized with NTP server (10.20.30.40) DT command terminated	A

A: In Normal Mode, the command terminates after displaying the current time.

EN (Environmental Information)

NML	MNT	m	b	u
X	X	X		

This command lists the states of the system's detected temperature and fan errors, etc. The components in the DC POWER OFF state are not supervised.

Table 3-30. EN Screen

Screen Image	Reference
iSPyz:---> en<*ENTER*> ---- Power Bay Units ---------- 19:20:57,01/31/2002 ---- state DPS0 DPS1 DPS2 DPS3 DPS4 DPS5 * MAIN PBAY00 ON --- --- ALARM --- --- * PBAY01 ON --- --- NORESP --- PBAY02 ON --- --- --- IOX PBAY10 OFF --- --- --- --- PBAY11 OFF --- --- --- --- ---------- ---- MAIN cabinet FANs ---------- 19:20:57,01/31/2002 ---- 0 1 2 *Front upper low ALARM low Front lower --- --- --- *Rear upper HIGH HIGH ALARM Rear lower --- --- --- ---------- Next page? (n[ext]/e[xit]/CR=next) : <*ENTER*> ---- CELL/XBC board DD-con/Temp alarm ---------- 19:20:57,01/31/2002 ---- state DD-con Temp CELL0 ON * CELL1 OFF ALARM * CELL2 NORESP * CELL3 OFF ALARM CELL4 --- --- --- CELL5 --- --- --- CELL6 --- --- --- CELL7 --- --- --- * XBC0 OFF ALARM * XBC1 NORESP XBC2 ON XBC3 ON ---------- Previous/Next page? (p[revious]/n[ext]/e[xit]/CR=next) : <*ENTER*> ---- PCIX-BOX DD-con/Temp/FAN alarm ---------- 19:20:57,01/31/2002 ---- state DD-con Temp FAN Local/Remote PCIX0(F) ON Remote * PCIX1(F) OFF ALARM ALARM Remote * PCIX2(F) ON --- ALARM Local * PCIX3(F) OFF --- ALARM Remote PCIX4(-) --- --- --- --- --- * PCIX5(F) NORESP PCIX6(F) ON Remote PCIX7(F) OFF Remote ----------	A B C D E

Table 3-30. EN Screen (cont'd)

Screen Image	Reference

```
Previous/Next page? (p[revious]/n[ext]/e[xit]/CR=next) : <ENTER>

---- Temperature (Celsius) [1/7] ---------------------------------------- 19:20:57,01/31/2002 ----
                    current        threshold                        comment
                                   FAN      IPMI      ACPI
      CELL0           46        45/ 50    60/ 62     80
        PROC00        50        80/ 85   100/102    105
    *   PROC01        82        80/ 85   100/102    105          FAN High-speed
        PROC02         -          -         -         -
        PROC03         -          -         -         -                                    G
    *  CELL1          52        45/ 50    60/ 62     80          FAN High-speed
        PROC10         -          -         -         -
        PROC11         -          -         -         -
        PROC12        70        80/ 85   100/102    105
    *   PROC13       103        80/ 85   100/102    105          reported to the software
-------------------------------------------------------------------------------------------------------

Previous/Next page? (p[revious]/n[ext]/e[xit]/CR=next) : <ENTER>

---- Temperature (Celsius) [2/7] ---------------------------------------- 19:20:57,01/31/2002 ----
                    current        threshold                        comment
                                   FAN      IPMI      ACPI
      CELL2           49        45/ 50    60/ 62     80          FAN High-speed
        PROC20        52        80/ 85   100/102    105
        PROC21        53        80/ 85   100/102    105
        PROC22        54        80/ 85   100/102    105
        PROC23        55        80/ 85   100/102    105                                    G
      CELL3           46        45/ 50    60/ 62     80
        PROC30        52        80/ 85   100/102    105
        PROC31        53        80/ 85   100/102    105
        PROC32        54        80/ 85   100/102    105
        PROC33        55        80/ 85   100/102    105
-------------------------------------------------------------------------------------------------------

Previous/Next page? (p[revious]/n[ext]/e[xit]/CR=next) : <ENTER>

---- Temperature (Celsius) [3/7] ---------------------------------------- 19:20:57,01/31/2002 ----
                    current        threshold                        comment
                                   FAN      IPMI      ACPI
    CELL4             49         5/ 50    60/ 62     80          FAN High-speed
      PROC40          52        80/ 85   100/102    105
      PROC41          53        80/ 85   100/102    105
      PROC42          54        80/ 85   100/102    105
      PROC43          55        80/ 85   100/102    105
    CELL5             46        45/ 50    60/ 62     80
      PROC50          52        80/ 85   100/102    105
      PROC51          53        80/ 85   100/102    105
      PROC52          54        80/ 85   100/102    105
      PROC53          55        80/ 85   100/102    105
-------------------------------------------------------------------------------------------------------

Previous/Next page? (p[revious]/n[ext]/e[xit]/CR=next) : <ENTER>
```

Table 3-30. EN Screen (cont'd)

Screen Image	Reference

```
---- Temperature (Celsius) [4/7] ---------------------------------------- 19:20:57,01/31/2002 ----
                        current        threshold                          comment
                                      FAN      IPMI      ACPI
      CELL6               49       45/ 50    60/ 62      80          FAN High-speed
        PROC60            52       80/ 85   100/102     105
        PROC61            53       80/ 85   100/102     105
        PROC62            54       80/ 85   100/102     105
        PROC63            55       80/ 85   100/102     105
      CELL7               46       45/ 50    60/ 62      80
        PROC70            52       80/ 85   100/102     105
        PROC71            53       80/ 85   100/102     105
        PROC72            54       80/ 85   100/102     105
        PROC73            55       80/ 85   100/102     105
-------------------------------------------------------------------------------------------------------

Previous/Next page? (p[revious]/n[ext]/e[xit]/CR=next) : <ENTER>

---- Temperature (Celsius) [5/7] ---------------------------------------- 19:20:57,01/31/2002 ----
                        current        threshold                          comment
                                      FAN      IPMI      ACPI
    * XBC0                52       45/ 50    60/ 62      65          FAN High-speed
    * XBC1                61       45/ 50    60/ 62      65          reported to the software
      XBC2                47       45/ 50    60/ 62      65
      XBC3                 -          -         -         -

    (XBC2)                         FAN      WARN1     WARN2
   * AIR FLOW IN          30       23/ 27     32         34          FAN High-speed
-------------------------------------------------------------------------------------------------------

Previous/Next page? (p[revious]/n[ext]/e[xit]/CR=next) : <ENTER>

---- Temperature (Celsius) [6/7] ---------------------------------------- 19:20:57,01/31/2002 ----
                        current        threshold                          comment
                                      FAN      IPMI      ACPI
    PCIX0(F)              45          -      60/ 62      65
        IORB              52          -      60/ 62      65
        DBP               49          -      60/ 62      65
    PCIX1(-)               -          -         -         -
        IORB               -          -         -         -
        DBP                -          -         -         -
    PCIX2(F)              45          -      60/ 62      65
        IORB              63          -      60/ 62      65          reported to the software
        DBP               45          -      60/ 62      65
    PCIX3(F)              45          -      60/ 62      65
        IORB              52          -      60/ 62      65
        DBP               45          -      60/ 62      65
-------------------------------------------------------------------------------------------------------

Previous/Next page? (p[revious]/n[ext]/e[xit]/CR=next) : <ENTER>
```

Table 3-30. EN Screen (cont'd)

Screen Image	Reference

```
---- Temperature (Celsius) [7/7] ------------------------------------ 19:20:57,01/31/2002 ----
                    current      threshold                    comment
                                 FAN      IPMI      ACPI
    PCIX4(F)          45          -      60/ 62      65
        IORB          52          -      60/ 62      65
        DBP           49          -      60/ 62      65
    PCIX5(-)           -          -        -          -
        IORB           -          -        -          -
        DBP            -          -        -          -
    PCIX6(F)          45          -      60/ 62      65
        IORB          63          -      60/ 62      65        reported to the software
        DBP           45          -      60/ 62      65
    PCIX7(F)          45          -      60/ 62      65
        IORB          52          -      60/ 62      65
        DBP           45          -      60/ 62      65
-------------------------------------------------------------------------------------------------------

Previous page? (p[revious]/e[xit]/CR=exit) : <ENTER>
```

Table 3-31. EN Screen References

Reference	Description
A	Displays the state of the Power Bay/Power Bay Unit in the cabinet. If an alarm occurs, an asterisk (*) mark appears at the beginning of the line. State ON : Indicates that DC (48V) is supplied to the devices in the cabinet. OFF: Indicates that DC (48V) is not supplied to the devices in the cabinet. ---: Indicates that no Power Bay Unit exists (not detected by the iSP). DPSx Normal: Indicates the normal state. ALARM : Indicates an alarm state. ---: Indicates that no Distributed Power Supply Module exists (not detected by the iSP).
B	Displays the state of the Fan Units located above and below the CPU/Memory Sub-chassis (16-way)/32-way) of the Main Cabinet. If an alarm occurs, an asterisk (*) mark appears at the beginning of the line. The Fan Units exist above and below the 32-way CPU/Memory Sub-chassis (32-way). CPU/Memory Sub-chassis (16-way) has no fan box below its location. -- : Indicates that it does not exist. ALARM: Indicates an alarm state. low: Indicates low-speed operation state. HIGH: Indicates high-speed operation state.

Table 3-31. EN Screen References (cont'd)

Reference	Description
C	When you press ENTER, the next page is displayed
D	Displays an alarm state for the DCDC converter on the CELL Board/XBC Board in the CPU/Memory Sub-chassis (16-way)/(32-way) in the Main Cabinet. If an alarm occurs, an asterisk (*) mark appears at the beginning of the line.
E	Displays an alarm state for the DCDC converter/fan/temperature of the Full/Half-size PCIX Unit. If an alarm occurs, an asterisk (*) mark appears at the beginning of the line.
F	Displays the temperature detected by the board/unit temperature sensor. If an alarm occurs, an asterisk (*) mark appears at the beginning of the line. Also displays the threshold values hard-coded in iSPFW. "FAN" indicates the threshold values for high-speed and low-speed fan rotation. "IPMI" indicates the threshold values at which a report is sent to the software via the IPMI interface. " ACPI " indicates the threshold values at which a report is sent to the software via the ACPI interface.

FV (Firmware Versions)

NML	MNT	m	b	u
X	X	X	X	X

This command displays the version information of the iSPFW and BIOS. The command performs a checksum of the storage area. It is managed independently in each iSP if the iSP is redundant.

Table 3-32. FV Screen

Screen Image	Reference
iSPyz:---> fv<*ENTER*> Firmware Versions : (currently running firmware is iSP FW bank1) iSP BOOT (*) : xx.xx generated on mm/dd/yyyy hh:mm:ss iSP FW bank0 : xx.xx generated on mm/dd/yyyy hh:mm:ss iSP FW bank1 (*) : xx.xx generated on mm/dd/yyyy hh:mm:ss BIOS bank0 (01 45) : xx.xx generated on mm/dd/yyyy hh:mm:ss PAL_Axx.xx PAL_Bxx.xx SALxx.xx BIOS bank1 (23 67) : xx.xx generated on mm/dd/yyyy hh:mm:ss PAL_Axx.xx PAL_Bxx.xx SALxx.xx Do you want to check the flash memory? (y/[n]) : y<*ENTER*> checking iSP BOOT bank... passed. checking iSP FW bank0... passed. checking iSP FW bank1... passed. checking BIOS bank0... passed. checking BIOS bank1... passed. FV command terminated.	A B C

Table 3-33 FV Screen References

Reference	Description
A	Displays the state of the current FW storage area.
B	To perform a checksum test of the storage area, enter “y”.
C	Displays the state of the checksum test.

HC (Hardware Configuration)

NML	MNT	m	b	u
X	X	X		

This command displays and changes the configuration information of the hardware.

The command displays and changes the partition settings.

See Table 3-38, “HC – ALL Display Screen” for an example of the HC display screen.

See the following tables for a list of hardware components and subcomponents and for a list of subcommands and descriptions.

Table 3-34. HC Components and Subcomponents

Component	Subcomponent (1)	Subcomponent (2)
CELL Board	Processor x4	--
	MMC x2	ROW x8 CACHE x8
	TAG x8	--
	CXI x2	--
XIC Board	CXI x4	--
	1.6G x4	--
	MOVER x2	--
	SERIAL CONSOLE x4	--
PCIX Unit	IOR	1.6G x2 IOC x2
	GXB x4 or GXB x2	--

Table 3-35 HC Subcommands

cmd	arg1	arg2	arg3	arg4	Description
help	-	-	-	-	Displays the list of subcommands. This command can be executed in the AC POWER ON or DC POWER ON state.
quit exit	-	-	-	-	Exits from the HC command. Before an exit, the check subcommand is automatically executed. This command can be executed in the AC POWER ON state or DC POWER ON state.
disp	-	-	-	-	Used to display states. Displays Help for “disp” when the argument is omitted or an error exists. This command can be executed in the AC POWER ON or DC POWER ON state.
	all	-	-	-	Displays all the states.
	part	-	-	-	Displays the following partition division information for each partition: • State summary • Physical CELL Board number and logical CELL Board number • Physical IOR Daughter Board number and logical IOR Daughter Board number • Amount of shared memory.
	main	-	-	-	Displays the state of the Main Cabinet. Installed PCIX Unit becomes a display target after the location setting is done correctly.
	iox	-	-	-	Displays the state of the I/O Expansion Cabinet. Installed PCIX Unit becomes a display target after the location setting is done correctly.
	other	-	-	-	Displays the components in which Main or I/O Expansion Cabinet cannot be determined because the location information is not fixed (i.e. no location is entered after the AD command is executed). These components may correspond to PCIX Unit.
	cpu	-	-	-	Displays the state of the CPU/Memory Sub-chassis (16-way)/(32-way).
	cell***x***	-	-	-	Displays the state of the CELL Board. “***x***” is the physical CELL Board number (0-7).

Table 3-35 HC Subcommands (cont'd)

cmd	arg1	arg2	arg3	arg4	Description
disp (cont'd)	mmc***xy***	-	-	-	Displays the detailed state of the ROW under control of the MMC specified by "***xy***". "***x***" is the physical CELL Board number (0-7) on which MMC is installed. "***y***" is the MMC number (0-1) in the CELL Board.
	tag***x***	-	-	-	Displays the detailed state of the TAG. "***x***" is the physical CELL Board number (0-7) on which TAG is installed.
	xbc***x***	-	-	-	Displays the state of the XBC Board. "***x***" is the physical XBC Board number (0-3).
	pcix***x***	-	-	-	Displays the state of the PCIX Unit. "***x***" is the DGI/I2C cable port number (0-7) from the iSP to the PCIX Unit.
	pbay***xy***	-	-	-	Displays the state of the Power Bay Unit. "***x***" is the cabinet number. 0: Main Cabinet 1: I/O Expansion Cabinet "***y***" is the ID number within the cabinet. 0-2 in the Main Cabinet 0-1 in the I/O Expansion Cabinet
attach	-	-	-	-	Used to associate partition numbers to CELL Boards and IOR Daughter Boards. The number of CELL Boards in a partition must be greater than the number of IOR Daughter Boards. Displays Help for "attach" when the argument is omitted or an error is made.
	cell***x***	***n***	***m***	-	Associates the CELL Board having the physical number ***x*** with the logical CELL Board number ***m*** of partition ***n***. (***m***: The number recognizable by the BIOS and software.) This command can also be used to change a logical CELL Board number if it has already been associated. Each logical CELL Board number must be unique among the 8 CELL Boards. You cannot change the logical number of the CELL Board in the online state.

Table 3-35 HC Subcommands (cont'd)

cmd	arg1	arg2	arg3	arg4	Description
attach (cont'd)	ior***x***	***n***	***m***	***p***	Associates the IOR Daughter Board having the physical number ***x*** with the logical IOR Daughter Board number ***m*** of partition ***n***. (***m***: The number recognizable by the BIOS and software.) "***p***" (0-9) sets the priority. Indicates which IOR Daughter Board is used with a higher priority if the number of normal CELL Boards is smaller than the number of normal IOR Daughter Boards due to CELL Board failure in the partition. (Smaller values have a higher priority, and the IOR Daughter Boards with larger values get isolated one by one. If the priority number is the same, the one with a smaller physical IOR Daughter Board number has a higher priority.) This command can be used to change the logical IOR Daughter Board number and priority if it has been already associated. The logical IOR Daughter Board number must be unique within the partition. You cannot change the logical IOR Daughter Board number or priority of the IOR Daughter Board which is in the online state. "Priority 0" is allowed one time for one partition and a Basic I/O Board must be connected. If any failure occurs in this IOR Daughter Board, the partition cannot be started. The IOR0 must have priority 0.
detach	-	-	-	-	Used to cancel the associations between partition numbers and CELL Boards/IOR Daughter Boards. You cannot detach any component that is in the online state. The number of CELL Boards in a partition must be greater than the number of IOR Daughter Boards. Displays Help of "detach" when the argument is omitted or an error is made.
	cell***x***	-	-	-	Disassociates the CELL Board having the physical number ***x*** from the currently associated partition.
	ior***x***	-	-	-	Disassociates the IOR Daughter Board having the physical number ***x*** from the currently associated partition.

Table 3-35 HC Subcommands (cont'd)

cmd	arg1	arg2	arg3	arg4	Description
swap	-	-	-	-	Used to swap a CELL Board with another CELL Board while the software is operating. (This is not a combination of "attach" and "detach". The process dedicated for "swap" is executed.) Displays Help for "swap" when the argument is omitted or an error is made. This subcommand can be executed on the partition in the DC POWER ON state. An execution of "swap" on the partitions requires the online configuration and de-configuration function of the OS.
	cell***x***	cell***y***	-	-	Swaps the operating CELL Board having the physical number ***x*** with the CELL Board having the physical number ***y***. No partition must be associated with CELL***y***. When the swap is complete, CELL***x*** is disassociated from the partition and CELL***y*** is associated to the partition. The logical CELL Board number is transferred from CELL***x*** to CELL***y***.
smem	-	-	-	-	Used to specify the size of the shared memory of the partition. Displays Help for "smem" when the argument is omitted or an error is made. This subcommand can be executed on the partition in the DC POWER OFF state.
	n	***mmm***	-	-	Specifies the size of the shared memory of partition ***n*** in units of MB. You cannot make any change to the partitions currently in operation. If the size is not a multiple of 128 MB, it is rounded up.

This subcommand is not supported at present.

This subcommand is not supported at present.

Table 3-35 HC Subcommands (cont'd)

cmd	arg1	arg2	arg3	arg4	Description
add	-	-	-	-	Used to instruct the iSP to add components manually. The management state of the iSP changes from "nonexist" to "power-off". Displays Help for "add" when the argument is omitted or an error is made. This subcommand can be executed in the AC POWER ON state or DC POWER ON state. When the Power Bay Unit is added, all partitions must be in the DC POWER OFF state.
	pbay***xy***	-	-	-	Adds a Power Bay Unit. "***x***" is the cabinet number. 0: Main Cabinet 1: I/O Expansion Cabinet "***y***" is the ID number within the cabinet. 0-2 for the Main Cabinet 0-1 for the I/O Expansion Cabinet
	dps***xyz***	-	-	-	Adds DPS to the Power Bay Unit. "***x***" and "***y***" are the same as described in "pbay" above. "***z***" is the number of Distributed Power Supply Module (DPS) in the Power Bay Unit (0-5).
	isp***x***	-	-	-	Adds an iSP Board. "***x***" is the physical number of the iSP Board (0 or 1).
	clk***x***	-	-	-	Adds a CLK Board. "***x***" is the physical number of the CLK Board (0 or 1).
	xbc***x***	-	-	-	Adds an XBC Board. "***x***" is the physical number of the XBC Board (0-3).
	cell***x***	-	-	-	Adds a CELL Board. "***x***" is the physical number of the CELL Board (0-7).

Table 3-35 HC Subcommands (cont'd)

cmd	arg1	arg2	arg3	arg4	Description
add (cont'd)	proc***xy***	-	-	-	Adds a processor. "***x***" is the physical CELL Board number (0-7). "***y***" is the processor installation location on the CELL Board (0-3).
	mmc***x1***	-	-	-	Adds a MMC (and ROW) on the Memory Daughter Board. The capacity of the DIMM is automatically read at memory initialization. "***x***" is the physical number of the CELL Board (0 or 7).
	pcix***x***	f|h	[bio]	-	Adds a PCIX Unit. "***x***" is the DGI/12C port number of the iSP side (0-7). "f|h" specifies the type of PCIX Unit (f[full]/h[alf]. If the Basic I/O Board is attached, specify "bio" as the third argument.
delete	-	-	-	-	Used to delete a component from the iSP management. If you do not delete it from the iSP management, the component which has been physically removed will still be managed as "INVISIBLE". You cannot delete any components in the DC ON state (except CLK Board and Distributed Power Supply Module). Displays Help for "delete" when the argument is omitted or an error is made.
	<arg1>	-	-	-	***<arg1>*** is the same as described in "add".
enable	-	-	-	-	Used to enable a component managed as "DISABLE". Displays Help for "enable" when the argument is omitted or an error is made.
	pbay***xy***	-	-	-	Enables the Power Bay Unit. "***x***" is the cabinet number. 0: Main Cabinet 1: I/O Expansion Cabinet "***y***" is the ID number within the cabinet. 0-2 in the Main Cabinet 0-1 in the I/O Expansion Cabinet
	clk***x***	-	-	-	Enables the CLK Board. "***x***" is the physical CLK Board number (0 or 1).

Table 3-35 HC Subcommands (cont'd)

cmd	arg1	arg2	arg3	arg4	Description
enable (cont'd)	xbc***x***	[all]	-	-	Enables the XBC Board. "***x***" is the XBC Board physical number (0-3). When the second argument is omitted, only the XBC Board is enabled, and the states of any other subcomponents do not change. When "all" is specified as the second argument, not only the XBC Board but also its subcomponents become enabled.
		cxi***x***	-	-	Enables the CELL Board interface part within the XBC Board. "***x***" is the interface part number (0-3). For XBC Board 0 and XBC Board 1: 0: Corresponds to CELL Board 0 1: Corresponds to CELL Board 1 2: Corresponds to CELL Board 2 3: Corresponds to CELL Board 3 For XBC Board 2 and XBC Board 3: 0: Corresponds to CELL Board 4 1: Corresponds to CELL Board 5 2: Corresponds to CELL Board 6 3: Corresponds to CELL Board 7 It coordinates with the interface part in the opposing CELL Board side.
		nci***x***	-	-	Enables the NC1/NC2 Board interface part within the XBC Board. "***x***" is the interface number (0-3). 0: 1.6G cable port 0 1: 1.6G cable port 1 2: XBC Board-XBC Board connection or free 3: XBC Board-XBC Board connection or free When the No. 2 interface is enabled by nci2, the No. 3 interface is automatically enabled (the opposite is the same). Also, when the No. 2 interface is disabled by nci2, the No. 3 interface is automatically disabled (the opposite is the same). The interface within the connected XBC Board is enabled or disabled simultaneously.
		mover***x***	-	-	Enables the MOVER part within the XBC Board. "***x***" is the mover number (0-1).

Table 3-35 HC Subcommands (cont'd)

cmd	arg1	arg2	arg3	arg4	Description
enable (cont'd)	cell***x***	[all]	-	-	Enables the CELL Board. "***x***" is the physical CELL Board number (0-7). When the second argument is omitted, only the CELL Board is enabled, and the states of any other subcomponents do not change. In this case, operation is rejected if some required components are disabled. When "all" is specified as the second argument, not only the CELL Board but also its subcomponents become enabled.
		cxi***y***	-	-	Enables the XBC interface part within the CELL Board. "***y***" is the interface part number (0-1). For CELL Board 0-3: 0: Corresponds to XBC Board 0 1: Corresponds to XBC Board 1 For CELL Board 4-7: 0: Corresponds to XBC Board 2 1: Corresponds to XBC Board 3 It coordinates with the interface part in the opposing XBC Board.
	proc***xy***	-	-	-	Enables the Processor. "***x***" is the physical CELL Board number (0-7). "***y***" is the Processor number (0-3) within the CELL Board .
	mmc***xy***	[all]	-	-	Enables the MMC. "***x***" is the physical CELL Board number (0-7). "***y***" is the MMC number (0-1) within the CELL Board. When the second argument is omitted, only the MMC is enabled, and the states of any other subcomponents do not change. When "all" is specified as the second argument, not only the MMC but also its subcomponents become enabled.
		row***z***	-	-	Enables the ROW. "***z***" is the ROW number (0-7). DIMM is not controlled individually. DIMMs are automatically detected at the time of startup.

Table 3-35 HC Subcommands (cont'd)

cmd	arg1	arg2	arg3	arg4	Description
enable (cont'd)	mmc***xy*** (cont'd)	cache***z***	-	-	Enables the Cache. "***z***" is the Cache number (0-7).
	tag***x***[***sy***]	-	-	-	Enables the TAG. "***x***" is the physical CELL Board number (0-7). "***s***" is either "e" (EVEN side) or "o" (ODD side). "***y***" is the TAG number (0-3). When "***sy***" is omitted, all the TAGs under the CELL Board specified by "***x***" become enabled.
	pcix***x***	all	-	-	Enables the Full/Half-size PCIX Unit. "***x***" is the DGI/I2C cable port number (0-7) of the cable from the ISPC Board to the Full/Half-size PCIX Unit. "all" must be specified as the second argument. Then, not only the PCIX Unit but also its subcomponents become enabled.
	ior***x***	[all]	-	-	Enables the IOR Daughter Board. "***x***" is the physical IOR Daughter Board number (0-7). When the second argument is omitted, only the IOR Daughter Board is enabled, and the states of any other subcomponents do not change. When "all" is specified as the second argument, not only the IOR Daughter Board but also its subcomponents become enabled.
		nci***y***	-	-	Enables the NC interface part. "***y***" is the interface number (0-1). It coordinates with the interface part in the opposing XBC Board, NC1/NC2 Board, or IOR Daughter Board.
		ioc***y***	-	-	Enables the IOC. "***y***" is the IOC number (0 or 1) within the IOR Daughter Board.

Table 3-35 HC Subcommands (cont'd)

cmd	arg1	arg2	arg3	arg4	Description
enable (cont'd)	gxb***xy***	-	-	-	Enables the GXB. "***x***" is the DGI/I2C cable port number of the cable from the iSP to the Full/Half-size PCIX Unit (0-7). "***y***" is the GXB number (0-3) within the Full/Half-size PCIX Unit.
		busA |busB	-	-	Enables the busA side and busB side of GXB.
disable	-	-	-	-	Used to disable a component manually. Displays Help for "disable" when the argument is omitted or an error is made. If the component is online state, the component can not be disabled.
	<arg1>	***<arg2>***	-	-	***<arg1>*** and ***<arg2>*** are the same as described in "enable" above. "all" cannot be specified.
online	-	-	-	-	Used to dynamically configure an offline component while the OS is running. This command functions only with the support of the software (OS and BIOS). This SP command may be unnecessary depending on the OS. Displays Help for "online" when the argument is omitted or an error is made.
	cell***x***	-	-	-	Configures the CELL Board for the OS.
	xbc***x***	mover***x***	-	-	Configures the XBC Board's mover for the OS.
	ior***x***	-	-	-	Configures the IOR Daughter Board for the OS.
offline	-	-	-	-	Used to dynamically delete an online component while the OS is running. This command functions only with the support of the software (OS and BIOS). This SP command may be unnecessary depending on the OS. Display Help for "offline" when the argument is omitted or an error is made.
	<arg1>	***<arg2>***	-	-	Same as described in "online" above.

Table 3-35 HC Subcommands (cont'd)

cmd	arg1	arg2	arg3	arg4	Description
ncconn	-	-	-	-	Used to set connection information of the 1.6G cable. Displays Help for "ncconn" when the argument is omitted or an error is made. This subcommand can be executed when all partitions are in the DC POWER OFF state.
	xbc***x***	nci***y***	ior***s***	nci***t***	Specifies the connection between the 1.6G port with the port number ***y*** in the XBC Board with the physical number ***x*** and the 1.6G port with the port number ***t*** in the IOR Daughter Board with the physical number ***s***.
	ior***s***	nci***t***	xbc***x***	nci***y***	
	ior***s***	nci***t***	ior***u***	nci***v***	Specifies the connection between the 1.6G port with the port number ***v*** in the IOR Daughter Board with the physical number ***u*** and the 1.6G port with the port number ***t*** in the IOR Daughter Board with the physical number ***s***.
ncdis	-	-	-	-	Used to disconnect the 1.6G cable. Displays Help for "ncdis" when the argument is omitted or an error is made. This subcommand can be executed when all partitions are in the DC POWER OFF state.
	xbc***x***	nci***y***	-	-	Removes the connection of the 1.6G port with the port number ***y*** in the XBC Board with the physical number ***x***. It is linked to the disconnection of the corresponding NC1/NC2 Board/IOR Daughter Board port (and vice versa).
	ior***s***	nci***t***	-	-	Removes the connection of the 1.6G port with the port number ***t*** in the IOR Daughter Board with the physical number ***s***. It is linked to the disconnection of the corresponding NC1/NC2 Board/IOR Daughter Board port (and vice versa).
led	-	-	-	-	Used to turn on/off a component's LED to identify its location. Displays Help for "led" when the argument is omitted or an error is made.
	clk***x***	on|off	-	-	Turns on/off the LED of the CLK Board. "***x***" is the physical CLK Board number (0-1).
	xbc***x***	on|off	-	-	Turns on/off the LED of the XBC Board. "***x***" is the physical XBC Board number (0-3).

Table 3-35 HC Subcommands (cont'd)

cmd	arg1	arg2	arg3	arg4	Description
led (cont'd)	cell***x***	on|off	-	-	Turns on/off the LED of the CELL Board. "***x***" is the physical CELL Board number (0-7).
	pcix***x***	on|off	-	-	Turns on/off the LED of the Full/Half-size PCIX Unit. "***x***" is the physical PCIX Unit number (0-7). When the PCIV is specified, all alarm LEDs are turned on.
loc	-	-	-	-	Used to specify location information manually. Displays Help for "loc" when the argument is omitted or an error is made. This subcommand can be executed when all partitions are in the DC POWER OFF state.
	pbay***xy***	***d***	***h***	-	Specifies the location and height of the Power Bay Unit in the cabinet. "***x***" is the cabinet number (0-1). "***y***" is the Power Bay Unit number in the cabinet. (0-2). "***d***" is the position of the lower edge of the unit in decimal (0-36) by using the EIA unit. (1 EIA unit = 44.45mm) "***h***" is the height of the unit (3,4).
	pcix***x***	***c***	***d***	l|r|f	Specifies in which cabinet the Full/Half-size PCIX Unit is located and the location of the unit in the cabinet. "***x***" is the PCIX Unit number (0-7). "***c***" is the cabinet number (0-3). "***d***" is the position of the lower edge of the unit in decimal (0-36) by using the EIA unit. (1 EIA unit = 44.45mm). "l|r|f" indicates the left, right, or both

Table 3-35 HC Subcommands (cont'd)

cmd	arg1	arg2	arg3	arg4	Description
check	-	-	-	-	Checks the current configuration information from the following points: • Presence of units whose location information is not entered • Presence of "DISABLE" components • Presence of "INVISIBLE" units Configuration violating the installation restrictions Configuration with penalty in performance/RAS. This subcommand can be executed in the AC POWER ON state or DC POWER ON state.
clear	mmc***xy***	row***z***	-	-	Clears the memory bit error counters of ROW. "***x***" is the physical CELL Board number (0-7). "***y***" is the MMC number (0-1) within the CELL Board. "***z***" is the ROW number (0-7).

Table 3-36. HC State Display Strings

Displayed String	Description
nonexist	Indicates that a component is defined as non-existent (i.e. the iSP manages a component as if it does not exist).
INVISIBLE	The iSP manages a component as if it exists, but it does not exist when seen from the iSP due to failure or other reasons. Once it is recognized by the iSP (regardless of auto detection or manual setting), it will be managed as if it exists unless you delete it explicitly using the "delete" command.
power-off	Indicates that the power supply (DC) is OFF. For some components, the power supply (DC) becomes ON when AC is supplied.
power-on	Indicates that the power supply (DC) is ON. For some components, it is overwritten by the following state display.
offline	Indicates that the power supply (DC) is ON and a component is not configured in the software (OS or BIOS). This applies to the CELL Board, XBC Board, PCIX Unit, and their subcomponents.
online	Indicates that the power supply (DC) is ON and a component is configured in the software (OS or BIOS). This applies to CELL Board, XBC Board, PCIX Unit, and their subcomponents.
master	This is valid only for the state display of the ISP Board/CLK Board. Indicates that it is operating as the master.

Table 3-36. HC State Display Strings (cont'd)

Displayed String	Description
backup	This is valid only for the state display of the ISP Board/CLK Board. Indicates that it is operating as the backup.
enable	Indicates that the component itself is enabled (used for system operation).
DISABLE	Indicates that the component itself is disabled (not used for system operation). In this state, it is detached from the system manually with the "disable" command.
DISABLE*	Indicates that the component itself is disabled (not used for system operation). In this state, it is detached from the system due to failure of the component itself or failure of the host interface. It should not be configured in the system until the defective part is replaced.
DEG	Indicates that some subcomponents are in the DISABLE state.

Table 3-37. HC Help Screen

Screen Image	Reference
iSPyz:---> hc*ENTER*> iSP FW version is Rxx.xx. HC> help<*ENTER*> HC command help : help : print this message. disp : display current status. smem : set size of shared memory of a partition. attach : attach CELLs and IORs to a partition. detach : detach CELLs and IORs from a partition. swap : swap CELLs in a partition. add : add a component. delete : delete a component. enable : enable a component. disable : disable a component. online : make a component online. offline : make a component offline. ncconn : connect 1.6G ports each other. ncdis : disconnect 1.6G ports. led : turn on/off maintenance LED of a component. loc : set location info. clear : clear memory bit error counters. check : check illegal configuration. quit : quit from HC command prompt.	A B

A: Displays Help for the HC command when you enter "help".

B: Displays the list of HC commands.

Table 3-38. HC ALL Display Screen

Screen Image	Reference
iSPyz:---> hc*ENTER*> iSP FW version is Rxx.xx. HC> disp all<*ENTER*> ==== Partitioning ================================= 19:20:23,01/31/2002 === part0(RUN) CELL:01-----7 (01-----2) IOR:0-----67 (0-----12) SM: 128MB part1(INIT) CELL:--2----- (--5-----) IOR:-1------ (-0------) SM: 0MB part2(STOP) CELL:---3---- (---4----) IOR:--2----- (--0-----) SM:1024MB part3(STOP) CELL:------6- (------3-) IOR:---3---- (---0----) SM: 0MB part4(----) CELL:-------- (--------) IOR:-------- (--------) SM:------ part5(----) CELL:-------- (--------) IOR:-------- (--------) SM:------ part6(----) CELL:-------- (--------) IOR:-------- (--------) SM:------ part7(----) CELL:-------- (--------) IOR:-------- (--------) SM:------ ========== ==== Main cabinet (loc=15/0) ========================= 19:20:23,01/31/2002 === PBAY00 (loc=15/0/00+3F) power-on enable DEG PBAY01 (loc=15/0/03+3F) power-on enable DEG PBAY02 (loc=15/0/06+3F) power-on enable ---- CPU/Memory sub-chassis [32way] (loc=15/0/18+8F) ---------19:20:23,01/31/2002 --- iSP0 (loc=15/0/18+8F/30) master ------- --- iSP1 (loc=15/0/18+8F/31) INVISIBLE ------- --- CLK0 (loc=15/0/18+8F/12) master enable --- CLK1 (loc=15/0/18+8F/13) backup DISABLE* --- XBC0 (loc=15/0/18+8F/08) offline enable DEG XBC1 (loc=15/0/18+8F/09) power-off DISABLE XBC2 (loc=15/0/18+8F/10) nonexist. XBC3 (loc=15/0/18+8F/11) online enable CELL0 (loc=15/0/18+8F/00) online enable DEG part.0 (LCN=0) CELL1 (loc=15/0/18+8F/01) offline DISABLE DEG part.0 (LCN=1) CELL2 (loc=15/0/18+8F/02) online enable part.1 (LCN=5) CELL3 (loc=15/0/18+8F/03) power-off enable part.2 (LCN=4) CELL4 (loc=15/0/18+8F/04) nonexist. CELL5 (loc=15/0/18+8F/05) nonexist. CELL6 (loc=15/0/18+8F/06) power-off DISABLE* part.3 (LCN=3) CELL7 (loc=15/0/18+8F/07 INVISIBLE enable part.0 (LCN=2) ---- PCIXs (Main) ---------- 19:20:23,01/31/2002 --- PCIX1(F) (loc=15/0/12+4F) online enable DEG part.1 (LIN=0,PRI=0) PCIX6(H) (loc=15/0/16+4F) offline enable DEG part.0 (LIN=0,PRI=9) PCIX7(G) (loc=15/0/20+4F) online enable DEG part.0 (LIN=1,PRI=0) ====End of Main cabinet========== ==== IOX cabinet (loc=15/1) ========================= 19:20:23,01/31/2002 === PBAY10 (loc=15/1/00+3F) power-on enable DEG PBAY11 (loc=15/1/03+3F) power-on enable DEG ACU21 (loc=15/1/06+3F) power-on enable --- ACU31 (loc=15/1/09+3F) power-on DISABLE* --- ---- PCIXs (IOX)---------- 19:20:23,01/31/2002 --- PCIX0(F) (loc=15/1/20+4F) online enable DEG part.0 (LIN=2,PRI=2) PCIX2(F) (loc=15/1/24+4F) online enable DEG part.1 (LIN=1,PRI=3) PCIX3(F) (loc=15/1/28+4F) offline enable DEG part.2 (LIN=0,PRI=0) ==== End of IOX cabinet========== ==== PCIXs on unknown cabinet ==================== 19:20:23,01/31/2002 === PCIX3(F) (loc=15/-/-----) power-off enable DEG PCIX4(F) (loc=15/-/-----) power-off enable DEG ==== End of PCIXs unknown cabinet ==========	A B C D E

Table 3-38. HC ALL Display Screen (cont'd)

Screen Image	Reference
---- CELL0 ---------- 19:20:23,01/31/2002 --- CELL0 (loc=15/0/18+8F/00) online enable DEG part.0 (LCN=2) PROC00 offline DISABLE --- PROC01 online enable --- PROC02 offline DISABLE* --- PROC03 nonexist. MMC00 online enable DEG MMC01 offline enable DEG TAG0 --------- -------- DEG CXI0 --------- enable --- -->XBC0 CXI0 CXI1 -------- disable --- --->XBC1 CXI0 IOM port0 --------- ------- --- IOR0-IOC1 IOM port1 --------- -------- --- IOR0-IOC0 ---- MMC00 ---------- 19:20:23,01/31/2002 --- MMC00 online enable DEG ROW0[DIMM00:01] 1024MB --------- enable --- SBE=000:000 MBE=000 ROW1[DIMM10:11] 512MB --------- enable --- SBE=000:000 MBE=000 ROW2[DIMM20:21] 1024MB --------- enable --- SBE=000:000 MBE=000 ROW3[DIMM30:31] 1024MB --------- DISABLE --- SBE=000:021 MBE=000 ROW4[DIMM40:41] 512MB --------- enable --- SBE=000:000 MBE=000 ROW5[DIMM50:51] -------MB --------- enable --- SBE=000:000 MBE=000 ROW6[DIMM60:61] 512MB --------- enable --- SBE=000:000 MBE=000 ROW7[DIMM70:71] -------MB --------- enable --- SBE=000:000 MBE=000 cache000 --------- enable --- cache001 --------- enable --- cache002 --------- enable --- cache003 --------- enable --- cache004 --------- DISABLE* --- cache005 --------- enable --- cache006 --------- enable --- cache007 --------- DISABLE ---	F G
---- MMC01 ---------- 19:20:23,01/31/2002 --- MMC01 offline enable DEG ROW0[DIMM00:01] 1024MB --------- enable --- SBE=000:000 MBE=000 ROW1[DIMM10:11] 512MB --------- enable --- SBE=000:000 MBE=000 ROW2[DIMM20:21] 1024MB --------- DISABLE --- SBE=000:000 MBE=000 ROW3[DIMM30:31] 1024MB --------- DISABLE --- SBE=000:021 MBE=000 ROW4[DIMM40:41] 512MB --------- enable --- SBE=000:000 MBE=000 ROW5[DIMM50:51] ------MB --------- enable --- SBE=000:000 MBE=000 ROW6[DIMM60:61] 512MB --------- enable --- SBE=000:000 MBE=000 ROW7[DIMM70:71] ------MB --------- enable --- SBE=000:000 MBE=000 cache010 --------- enable --- cache011 --------- enable --- cache012 --------- enable --- cache013 --------- enable --- cache014 --------- DISABLE* --- cache015 --------- enable --- cache016 --------- enable --- cache017 --------- DISABLE ---	H

Table 3-38. HC ALL Display Screen (cont'd)

Screen Image	Reference
---- TAG0 ---------- 19:20:23,01/31/2002 --- TAG0 --------- -------- DEG TAG0e0 --------- DISABLE --- TAG0e1 --------- enable --- TAG0e2 --------- DISABLE* --- TAG0e3 --------- enable --- TAG0o0 --------- enable --- TAG0o1 --------- DISABLE --- TAG0o2 --------- enable --- TAG0o3 --------- enable --- ---- CELL1 ---------- 19:20:23,01/31/2002 --- : : :	I
---- XBC0 [32way]---------- 19:20:23,01/31/2002 --- XBC0 (loc=15/0/18+8F/08) online enable DEG CXI0 -------- enable --- --->CELL0 CXI0 CXI1 -------- DISABLE* --- --->CELL1 CXI0 CXI2 -------- enable --- --->CELL2 CXI0 CXI3 -------- DISABLE* --- --->CELL3 CXI0 1.6G port0 -------- enable --- --->IOR0 port01 1.6G port1 -------- DISABLE* --- --->IOR1 port0 1.6G port2 -------- enable --- --->XBC2 port2 1.6G port3 -------- enable --- --->XBC2 port3 MOVER0 -------- enable --- MOVER1 -------- DISABLE --- SERIAL0 -------- used --- part.0 SERIAL1 -------- not used --- SERIAL2 -------- used --- part.1 SERIAL3 -------- disable --- part.2 ---- XBC1 [32way] ---------- 19:20:23,01/31/2002 --- : : :	J
---- PCIX0(F) ---------- 19:20:23,01/31/2002 --- IOR0 (loc=15/1/0948F) online enable DEG part.0 (LIN=2,PRI=0) 1.6G port0 -------- enable --- --->XBC0 port0 1.6G port1 -------- enable --- --->XBC1 port1 IOC00 -------- enable DEG IOC01 -------- enable DEG GXB00 (loc=15/1/09+4F) -------- enable --- BUS-A -------- enable --- BIO BUS-B -------- enable --- GXB01 (loc=15/1/09+4F) -------- enable --- BUS-A -------- enable --- BUS-B -------- enable --- GXB02 (loc=15/1/09+4F) -------- enable --- BUS-A -------- enable --- BUS-B -------- enable --- GXB03 (loc=15/1/09+4F) -------- enable --- BUS-A -------- enable --- BUS-B -------- enable ---	K

Table 3-38. HC ALL Display Screen (cont'd)

Screen Image	Reference
---- PCIX2(H) ---------- 19:20:23,01/31/2002 --- IOR2 (loc=15/1/13+4R) offline enable DEG part.0 (LIN=2,PRI=9) 1.6G port0 -------- enable --- --->XBC2 port0 1.6G port1 -------- enable --- --->XBC3 port1 IOC20 -------- enable DEG IOC21 -------- enable DEG GXB20 (loc=15/1/13+4R) -------- enable --- BUS-A -------- enable --- BIO BUS-B -------- enable --- GXB22 (loc=15/1/13+4R) -------- enable --- BUS-A -------- enable --- BUS-B -------- enable --- : : : ---- PBAYs (Main cabinet) ---------- 19:20:23,01/31/2002 --- PBAY00 (loc=15/0/00+3F) power-on enable DEG DPS000 DPS001 INVISIBLE DPS002 DPS003 INVISIBLE DPS004 nonexist. DPS005 nonexist. PBAY01 (loc=15/0/03+3F) power-on enable DEG DPS010 DPS011 INVISIBLE DPS012 ALARM DPS013 DPS014 nonexist. DPS015 nonexist. PBAY02 (loc=15/0/03+3F) power-on enable DEG DPS020 DPS021 INVISIBLE DPS022 ALARM DPS023 DPS024 nonexist. DPS025 nonexist. ---- PBAYs (IOX cabinet) ---------- 19:20:23,01/31/2002 --- PBAY10 (loc=15/1/00+3F) power-on enable DEG DPS100 DPS101 DPS102 INVISIBLE DPS103 DPS104 nonexist. DPS105 nonexist. PBAY11 (loc=15/1/---) nonexist. DPS110 nonexist. DPS111 nonexist. DPS112 nonexist. DPS113 nonexist. DPS114 nonexist. DPS115 nonexist.	L

Table 3-39. HC ALL Display Screen References

Reference	Description
A	Displays the partition configuration information.
B	Displays the configuration information of the units/devices in the Main Cabinet.
C	Displays the configuration information of the PCIX Unit in the Main Cabinet.
D	Displays the configuration information of the units/devices in the I/O Expansion Unit.
E	Displays the configuration information of the PCIX Unit in the I/O Expansion Cabinet.
F	Expands the CELL Board and displays the configuration information.
G	Expands the MMC and displays the configuration information.
H	Expands the Memory Daughter Board and displays the configuration information.
I	Expands the TAG and displays the configuration information.
J	Expands the XBC Board and displays the configuration information.
K	Expands the PCIX Unit and displays the configuration information.
L	Expands the Power Bay Unit and displays the configuration information.

HE (Help)

NML	MNT	m	b	u
X	X	X	X	X

This command displays the list of commands.
The list of commands differs for Normal Mode and Maintenance Mode.

> ***Note:*** This command can also be executed by entering HELP.

Table 3-40. HE Display Screen

Screen Image	Reference
iSPyz:---> he*ENTER*> iSP commands : System Control (both customers and maintenance persons) DF – Shut down the system (override) DN – Shut down the system DP – Generate the system dump interrupt PC – Power cycle RS – Cold reset the system UP – Bring up the System Configuration (both customers and maintenance persons) HC – Hardware configuration and partitioning Miscellaneous (both customers and maintenance persons) CM – Change SP command mode DL – Display SP logs DT – SP Date and Time EN – Display environmental information FV – Display firmware versions HE – Display this help ML – Display message log HE command terminated.	A

A: Displays help for Normal Mode commands.

ML (Message Log)

NML	MNT	m	b	u
X	X	X	X	X

This command displays the contents of the iSP message buffer.

(The message output generated in the display operation of the message buffer is not stored in the message buffer.)

Table 3-41. ML Display Screen

Screen Image	Reference
iSPyz:---> ml*ENTER*> ML command displays iSP's message log buffer. Select interactive mode? (i[nteractive per page]/a[ll]/CR=exit) : i<*ENTER*> ***** start of message logs ********** xxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx : : : xxxxxxxxxxxxxxxxxxxxx Next ? (n[ext]/CR=exit) : n<*ENTER*> xxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx : : : xxxxxxxxxxxxxxxxxxxxxxxxxx Previous/Next ? (p[revious]/n[ext]/CR=exit) : n<*ENTER*> xxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx : : : xxxxxxxxxxxxxxxxxx Previous ? (p[revious]/CR=exit) : <*ENTER*> ***** end of message logs ********** ML command terminated.	A B C D E

Table 3-42. ML Display Screen References

Reference	Description
A	Select either the mode that prompts you every page or the mode that displays the entire buffer at the same time.
B	Prompts you to respond if the next page exists.
C	Prompts you to respond if the previous and next pages exist.
D	Prompts you to respond if the previous page exists.
E	Displays the command termination message.

PC (Power Cycle)

NML	MNT	m	b	u
X	X	X		

This command turns off the power (DC) of the system, and then turns it on again to start up the system.

> ***Note:*** This command turns off the system regardless of the operation state of the OS or BIOS and without notifying either.

Table 3-43. PC Display Screen

Screen Image	Reference
iSPyz:---> pc*ENTER*> CAUTION: System power will be turned off without any notice to the softwares even if they are running. Enter partition number (0-37all/CR=exit) : all<*ENTER*> Execute OK? (y/[n]) y<*ENTER*> PC command was accepted. System power of all partitions will be turned off soon and then will be turned on. [iSPyz:INFO.ccc] partition 0 : power off sequence started. [iSPyz:INFO.ccc] partition 1 : power off sequence started. : [iSPyz:INFO.ccc] partition 1 : power off sequence completed normally. : [iSPyz:INFO.ccc] partition 0 : power on sequence started. [iSPyz:INFO.ccc] partition 1 : power on sequence started. : [iSPyz:INFO.ccc] partition 1 : power on sequence completed normally. : [iSPys:INFO.ccc] partition 1 : handed off the control to BIOS.	 A B C D

Table 3-44. PC Display Screen References

Reference	Description
A	Enter a partition number If you select “all”, all the configured partitions become the targets. However, the partitions that are already OFF do not become the targets
B	Displays the confirmation message. To execute, enter “y.”
C	Displays the PC command acceptance message. The actual process runs in the background.
D	Displays the state of the process running tin the background.

RS (Cold Reset System)

NML	MNT	m	b	u
X	X	X		

This command performs a cold reset of the system.

> **Note:** This command performs a reset without any notification even if the OS (BIOS) is running.

Table 3-45. RS Display Screen

Screen Image	Reference
iSPyz:---> rs*ENTER*> CAUTION: System will be reset without any notice to the softwares even if they are running. Enter partition number (0-3/all/CR=exit) : all<*ENTER*> Execute OK? (y/[n]) y<*ENTER*> RS command was accepted. All partitions will be resetted soon. [iSPyz:INFO.ccc] partition 0 : initializing HW. [iSPyz:INFO.ccc] partition 1 : initializing HW. : : : [iSPyz:INFO.ccc] partition 0 : handed off the control to BIOS. [iSPyz:INFO.ccc] partition 1 : handed off the control to BIOS.	 A B C D

Table 3-46. RS Display Screen References

Reference	Description
A	Enter a partition number If you select “all”, all the configured partitions become the targets. However, the partitions that are already OFF do not become the targets
B	Displays the confirmation message. To execute, enter “y.”
C	Displays the RS command acceptance message. The actual process runs in the background.
D	Displays the state of the process running tin the background.

UP (Bring Up System)

NML	MNT	m	b	u
X	X	X		

This command turns on the power (DC) of the system, initializes the hardware, and then starts up the BIOS.

Whether the operating system starts up depends on the BIOS/EFI settings.

> ***Note:*** The UP command can be executed in Normal mode or Maintenance mode.

Table 3-47. UP Display Screen

Screen Image	Reference
iSPyz:---> up*ENTER*> This command will bring up the specified partition. Enter partition number (0-3/all/CR=exit) : all<*ENTER*> Execute OK? (y/[n]) y<*ENTER*> UP command was accepted. All partitions will run soon. [iSPyz:INFO.ccc] partition 0 : power on sequence started. [iSPyz:INFO.ccc] partition 1 : power on sequence started. : [iSPyz:INFO.ccc] partition 1 : power on sequence completed normally. : [iSPys:INFO.ccc] partition 1 : handed off the control to BIOS.	 A B C D

Table 3-48. RS Display Screen References

Reference	Description
A	Enter a partition number If you select “all”, all the configured partitions become the targets.
B	Displays the confirmation message. To execute, enter “y.”
C	Displays the UP command acceptance message. The actual process runs in the background.
D	Displays the state of the process running in the background.

4

BIOS Setup

- Setup Overview
- Menu Tree
- Menu Options and Settings
- BIOS Virtual DIP Switch
- PCI Online Maintenance (PCI Hot Plug)

Setup Overview

See the following sections for a description of BIOS Setup, when you need to change BIOS settings, and how to start and use BIOS Setup.

What is Setup?

Setup is a utility that allows you to set up the system hardware. Settings for PCI Bridges and devices that connect with the system are included. Setup is incorporated in the BIOS, and can be executed without any dedicated utility disk.

In most cases, you do not have to use Setup because the settings for it have already been optimized prior to the system being shipped. However, you can use Setup for the cases described in the next section.

When You Should Change the Settings

Start Setup and change the settings in the following cases:

- Some setting errors exist.
- Settings of CMOS and/or NVRAM are cleared.

  Two types of NVRAM exist: NVRAM for BIOS and NVRAM for SPFW. The NVRAM above is the one for the BIOS.
- Adding or deleting a boot device.
- The BIOS version has changed.
- The Host Bus Bridge (HBB) configuration has changed.

You can also perform the following:

- Set and/or change the date/time setting.
- Set and/or change the interrupt setting of the standard I/O (for example: serial port, mouse).
- Set and/or change the serial console redirection.
- Set and/or change the resource reservation for online maintenance support.

Some Setting Errors Exist

The settings for Setup are stored in nonvolatile memory (CMOS and NVRAM). If the settings in CMOS and/or NVRAM are lost, the BIOS initializes the settings and restarts the system. If a CMOS/NVRAM error is detected, check the status of the error by looking at the BIOS Event Log in iSP. *

*Log description "0251 System CMOS checksum bad - Default configuration used"

"910F System NvRAM checksum bad - Default configuration used"

If an error is detected in the system clock, the following error message is displayed.

(The system clock is called real time clock (RTC).)

```
0271: Check date and time settings
```

If changes had previously been made to the settings of the system, changes must be made again. After POST (Power On Self-Test) is finished, the following message is displayed.

```
Press <F2> to Setup
```

The system will wait for a key entry. Press the F2 key to start Setup.

Settings of CMOS and/or NVRAM Are Cleared

You can clear the settings in CMOS/NVRAM by using BIOS virtual DIPSW, which can be specified by the "su" command of iSP. For BIOS virtual DIPSW, any hexadecimal value of 8 digits can be specified. Setting values other than the ones listed in the table below cannot be used because they are already reserved. In addition, when a clear operation is performed, the setting value is automatically cleared to "0." It is not necessary to set "0" as a clear operation.

See the section "BIOS Virtual Dip Switch" later in this chapter and Table 4-28 for more information about the Virtual DIP switch settings.

Table 4-1. BIOS Virtual DIPSW Setting Value (NvRAM/CMOS clear command only)

Setting Value	Operation
80000000	Clears CMOS/NVRAM entirely.
40000000	Clears the Supervisor/User Password specified by Setup.
20000000	Clears only the area of CMOS/NVRAM used by BIOS.
10000000	Clears only the area of NVRAM used by EFI/OS.
00003102	Windows® Server 2003
00000000	Linux (NEC Linux)

Adding or Deleting a Boot Device

To add or delete a boot device, you must enable or disable the Option ROM expansion of the PCI card to which the boot device is connected. To add a boot device, specify to "enable the Option ROM expansion of the PCI card that controls the boot device" in the Option ROM submenu in the Advanced menu of Setup. To delete a boot device, specify to "disable the Option ROM expansion of the PCI card" in the same submenu.

"Option ROM expansion" — to store the Option ROM data of the PCI card in memory.

The BIOS Version Has Changed

When changing the BIOS version, start Setup and change the settings.

Change the setting values of Setup to the default values (Specify “Load Setup Defaults” in the Exit menu).

The Host Bus Bridge Configuration Has Changed

When the configuration is changed due to the addition or deletion of the Host Bus Bridge, some setting values are reset to their initial states. Settings must be manually changed again.

- If you had changed the setting of whether to operate the Option ROM expansion from the initial value in the PCI slot where the boot device is installed, settings can be changed again using the Option ROM submenu in the Advanced menu.
- If the settings had been changed from the initial values in the Host Bus Bridge configuration submenu in the System Hardware menu, settings must be changed again.

Starting Setup

When the system starts and while POST is being executed, the following message is displayed in the lower left of the screen.

```
Press <F2> to enter Setup
```

If you press the F2 key while this message is displayed, Setup starts and the Main menu screen appears.

If an error is detected during POST, the following message is displayed.

```
Press <F1> to resume, <F2> to Setup
```

If you press the F2 key, Setup starts. The message in the lower left changes to the following message.

```
Entering SETUP ...
```

Screen Description

To configure Setup, use the keys on the bottom portion of the screen.

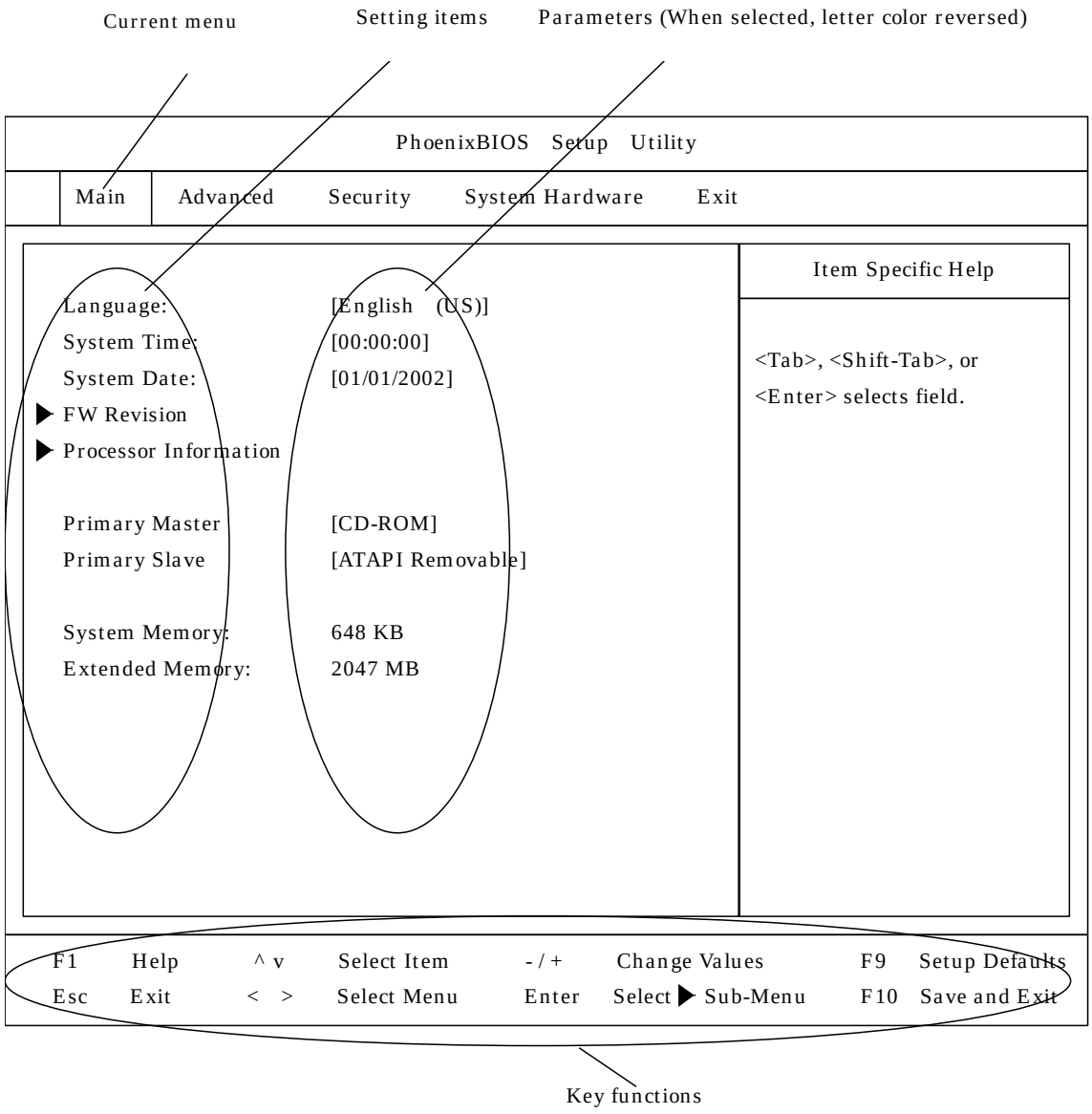


Figure 4-1. Screen Description

Table 4-2. Key Functions

Item	Description
F1 key	Displays the help screen.
Cursor key (^ / v) (cursor_up / cursor_down)	Selects the item displayed on the screen. The highlighted item is the one currently selected.
- key / + key	Changes the value of the selected item (parameter). If a submenu (an item with ▶ in front) is selected, this key is disabled.
F9 key	Restores the default value of the parameter of the item currently displayed.
ESC key	Returns to the previous screen.
Cursor key (<- / ->) (cursor_left / cursor_right)	Selects a menu.
Enter key	Confirms the selected parameter.
F10 key	Saves the specified parameter and exits from Setup.

Menu Tree

Setup has the following five menus:

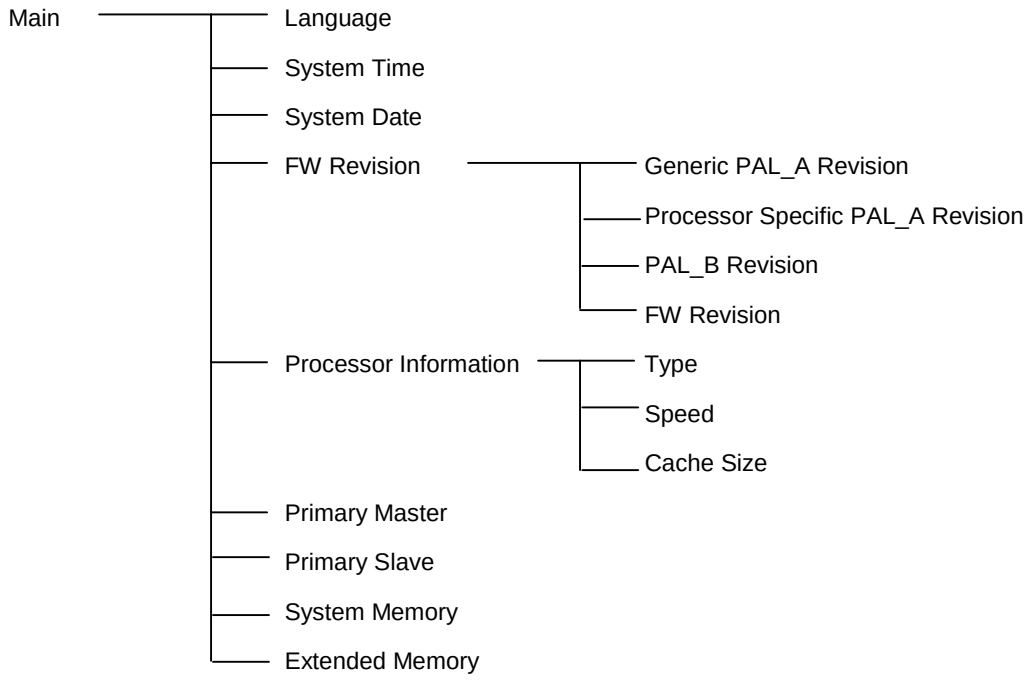
- Main menu
- Advanced menu
- Security menu
- System Hardware menu
- Exit menu.

From each menu, you can select a submenu to perform more detailed actions. The following sections show the available functions and parameters in tree format.

Main Menu Overview

In the main menu, you can perform the following actions. For detailed information on the functions and parameters, refer to “Main Menu.”

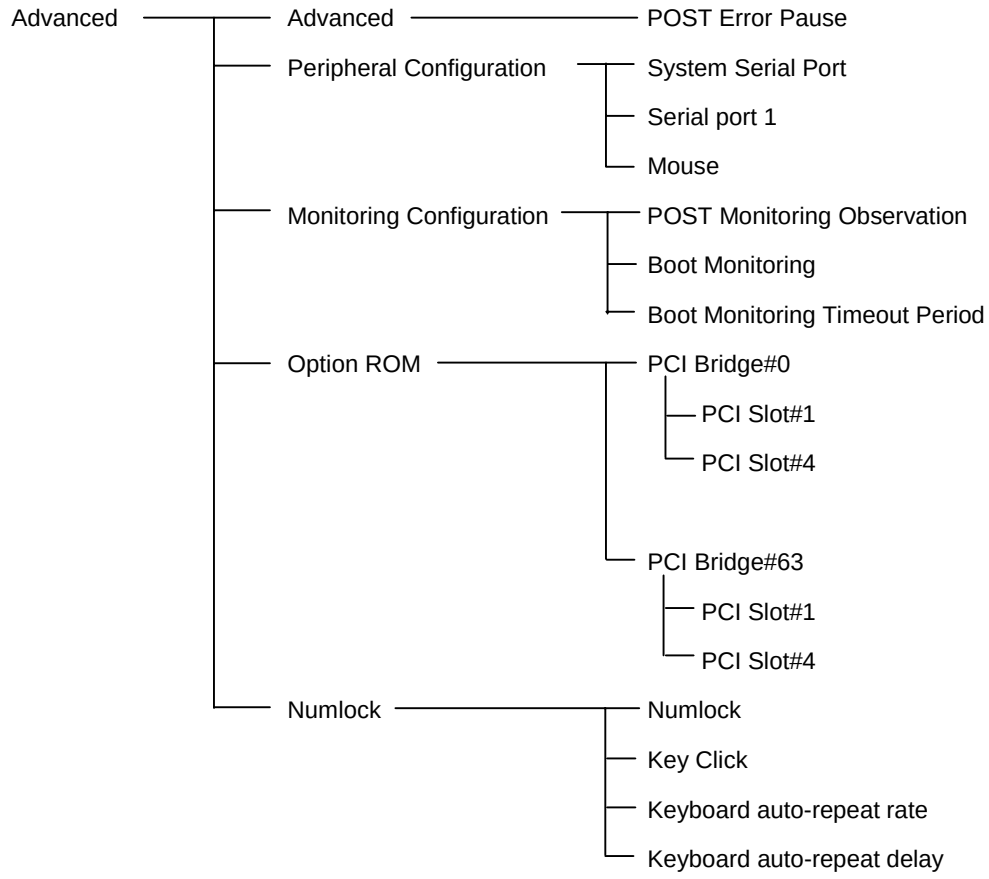
- View the language used
- View/set date and time
- View the firmware revision
- View CPU information
- View the IDE devices installed
- View the memory capacity of the system



Advanced Menu Overview

In the Advanced menu, you can perform the following actions. For detailed information on the functions and parameters, refer to “Advanced Menu.”

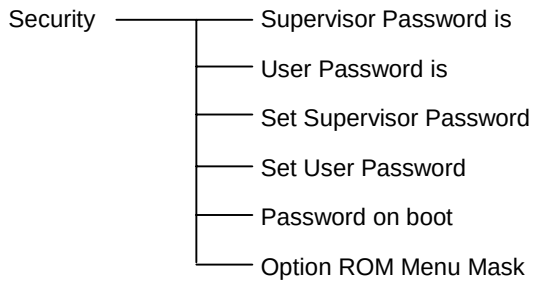
- Specify behavior when a POST error occurs.
- Configure I/O devices
- Stall monitoring at the BIOS boot
- Stall monitoring at the OS boot
- Set the Option ROM expansion of the PCI device
- Set the keyboard attributes



Security Menu Overview

In the Security menu, you can perform the following actions. For detailed information on the functions and parameters, refer to “Security Menu.”

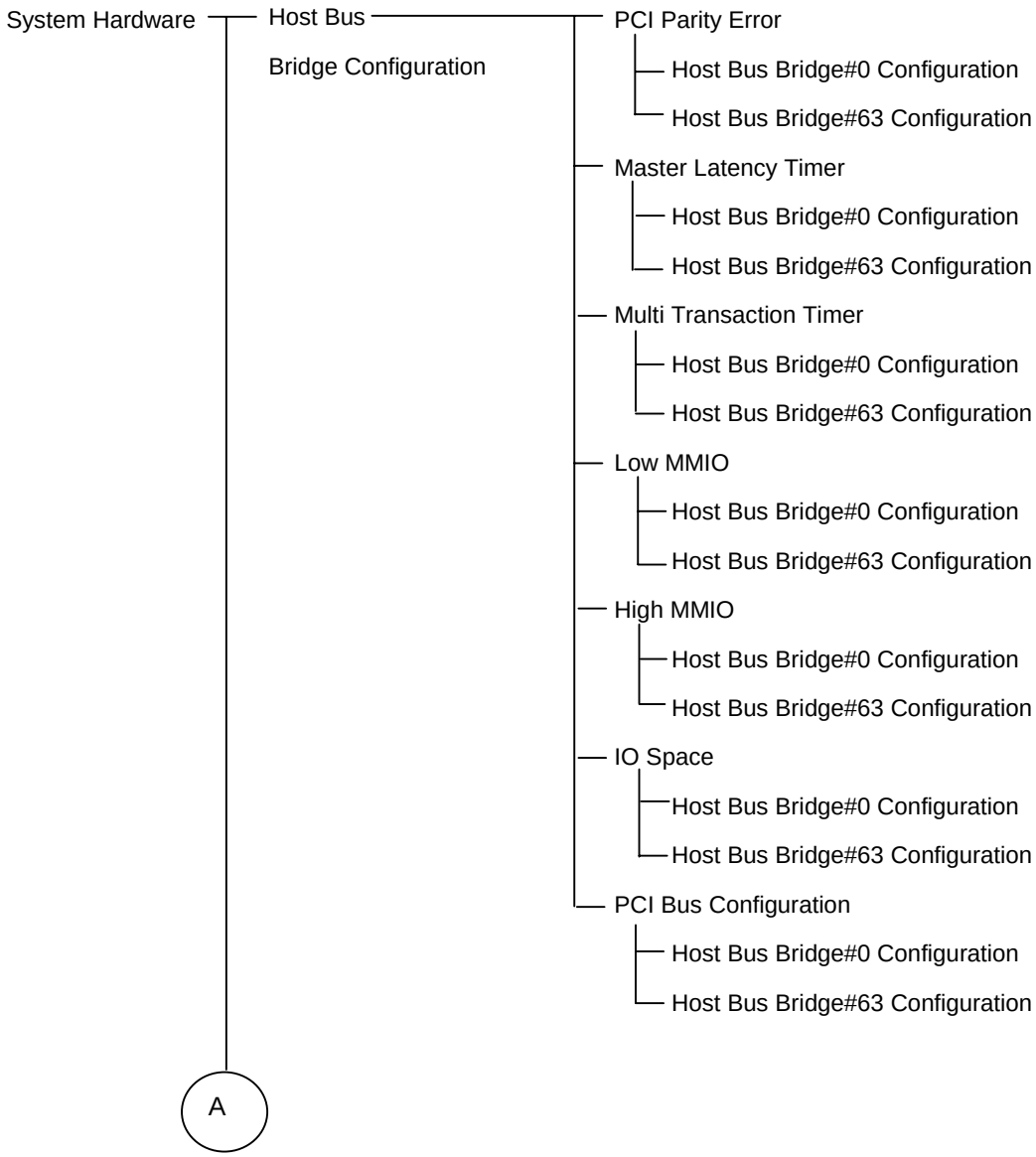
- Display whether the password of the supervisor (administrator) is set; or set a password
- Display whether the password of the general user is set; or set a password
- Set a Password for the BIOS boot
- Disable key operation when the Option ROM menu of the PCI device is executed

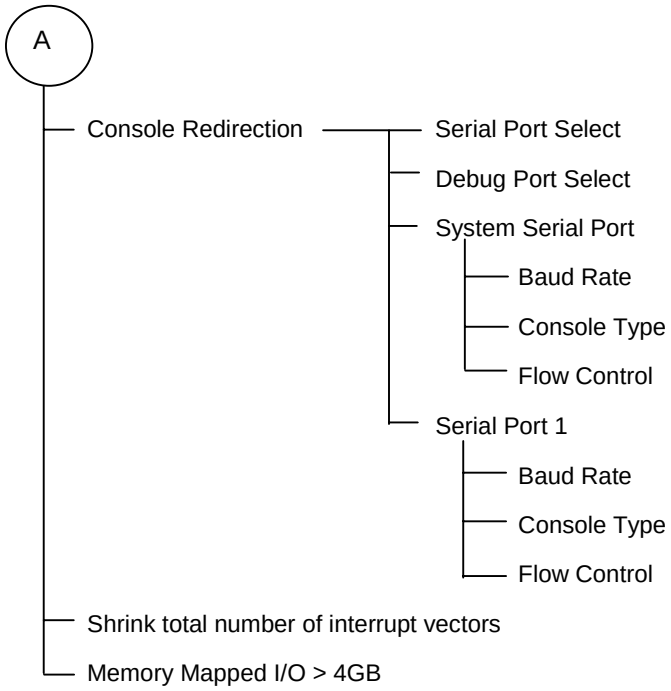


System Hardware Menu Overview

In the System Hardware menu, you can perform the following actions. For detailed information on the functions and parameters, refer to “System Hardware Menu.”

- Set the parameters of the PCI host bus bridge
- Set the serial console redirection function
- Set the number of interrupt vectors
- Set whether to use High MMIO

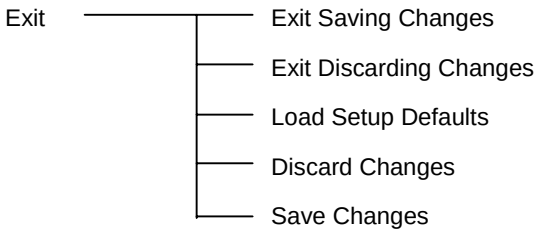



A
Console Redirection
Serial Port Select
Debug Port Select
System Serial Port
Baud Rate
Console Type
Flow Control
Serial Port 1
Baud Rate
Console Type
Flow Control
Shrink total number of interrupt vectors
Memory Mapped I/O > 4GB

Exit Menu Overview

In the Exit menu, you can perform the following actions. For detailed information on the functions and parameters, refer to “Exit Menu.”

- Exit from Setup saving all changes
- Exit from Setup without saving any changes
- Restore the initial values
- Restore the settings, discarding any changes
- Save the changes to the settings



Menu Options and Settings

The following sections provide BIOS Setup menu screens, menu options, and descriptions of the settings.

Main Menu

When you start Setup, the Main menu appears first.

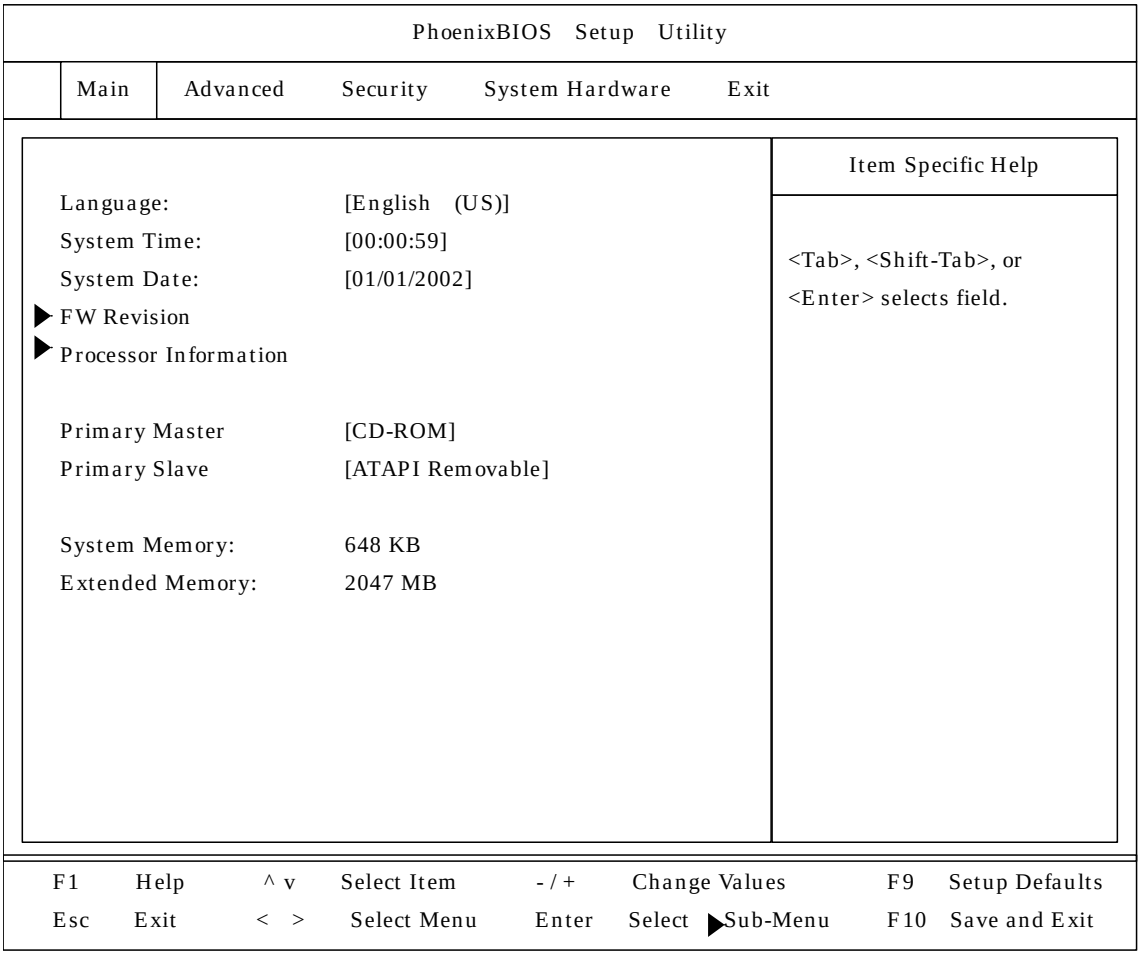


Figure 4-2. Main Menu

The options you can set on the Main menu screen and their functions are shown below. For the Primary Master and the Primary Slave, the respective submenus appear when you press the Enter key after you select it.

Table 4-3. Main Menu Options

Menu	Option	Description
Language	English	Displays the language used (Only English available).
System Time	HH:MM:SS	Sets the time.
System Date	MM/DD/YYYY	Sets the date.
FW Revision	Generic PAL_A	Displays the revision of the micro code of the processor.
	Processor Specific PAL_A	Displays the revision of the micro code of the processor.
	PAL_B	Displays the revision of the micro code of the processor.
	FW	Displays the revision of the FW.
Processor Information	Type	Displays the formal name of the Processor (BSP).
	Speed	Displays the operation clock of the Processor (BSP).
	Cache Size	Displays the L3 cache size of the Processor (BSP).
Primary Master	N/A	Displays the connected IDE device.
Primary Slave	N/A	Displays the connected IDE device.
System Memory	N/A	Displays the total amount of base memory. Fixed at 640 KB.
Extended Memory	N/A	Displays the total amount of the extended memory.

BSP: BootStrap Processor

Advanced Menu

When you move the cursor over “Advanced” by using the arrow keys (< and >), the Advanced menu appears. For information on the option functions, refer to “Table 4-4 Advanced Menu Options.”

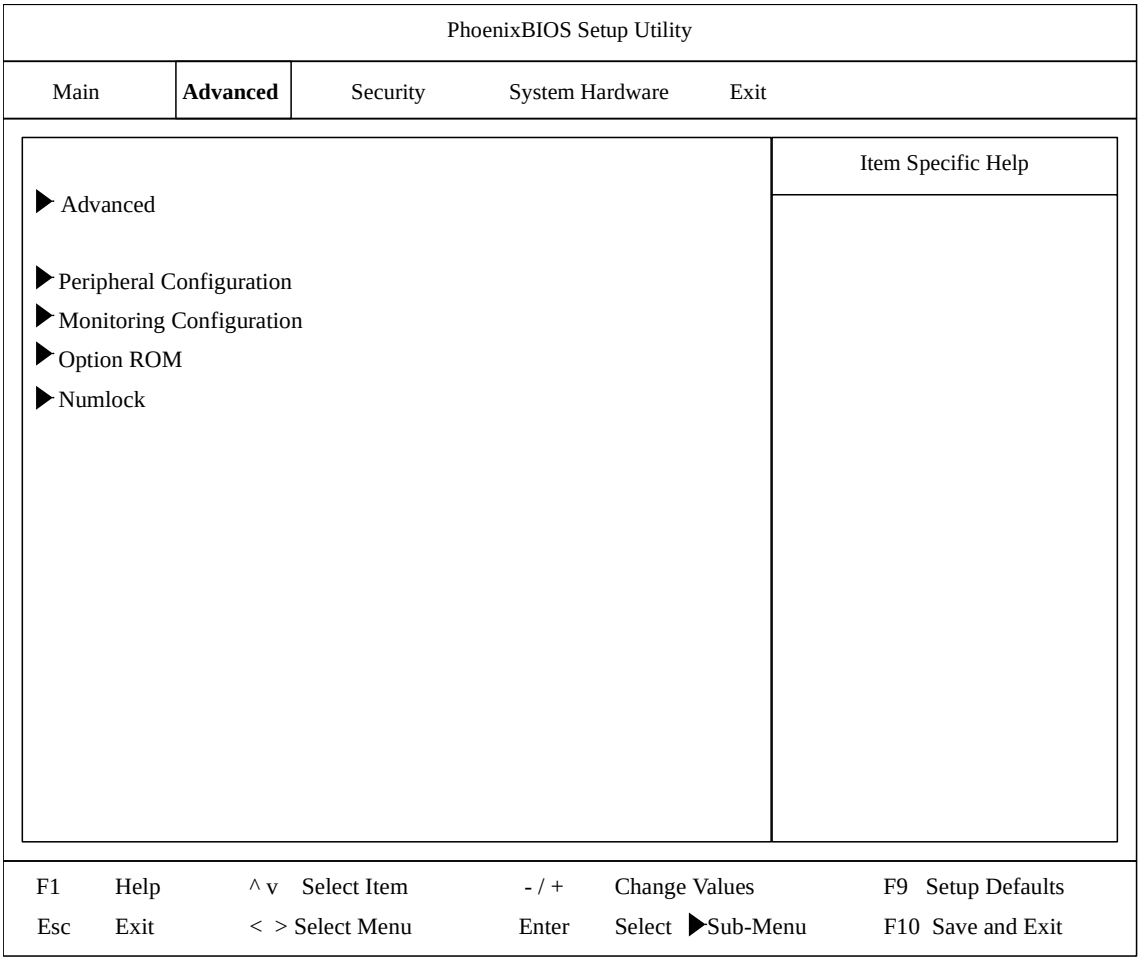


Figure 4-3. Advanced Menu

Table 4-4. Advanced Menu Options

Menu	Option	Description
Advanced	--	Specifies available options for when an error occurs during POST. For more information, refer to “Advanced Submenu”
Peripheral Configuration	--	Displays/changes the settings of built-in I/O devices. For more information, refer to “Peripheral Configuration Submenu.”
Monitoring Configuration	--	Displays/changes the settings of stall monitoring at the BIOS startup and OS startup. For more information, refer to “Monitoring Configuration Submenu.”
Option ROM	--	Displays/changes the settings of Option ROM expansion of the PCI device installed on the system. For more information, refer to “Option ROM Submenu.”
Numlock	--	Displays/changes the settings of the keyboard. For more information, refer to “Numlock Submenu.”

Advanced Submenu

When you select “Advanced” on the Advanced menu, the following screen appears. For more information on the option functions, refer to “Table 4-5 Advanced Submenu Options.”

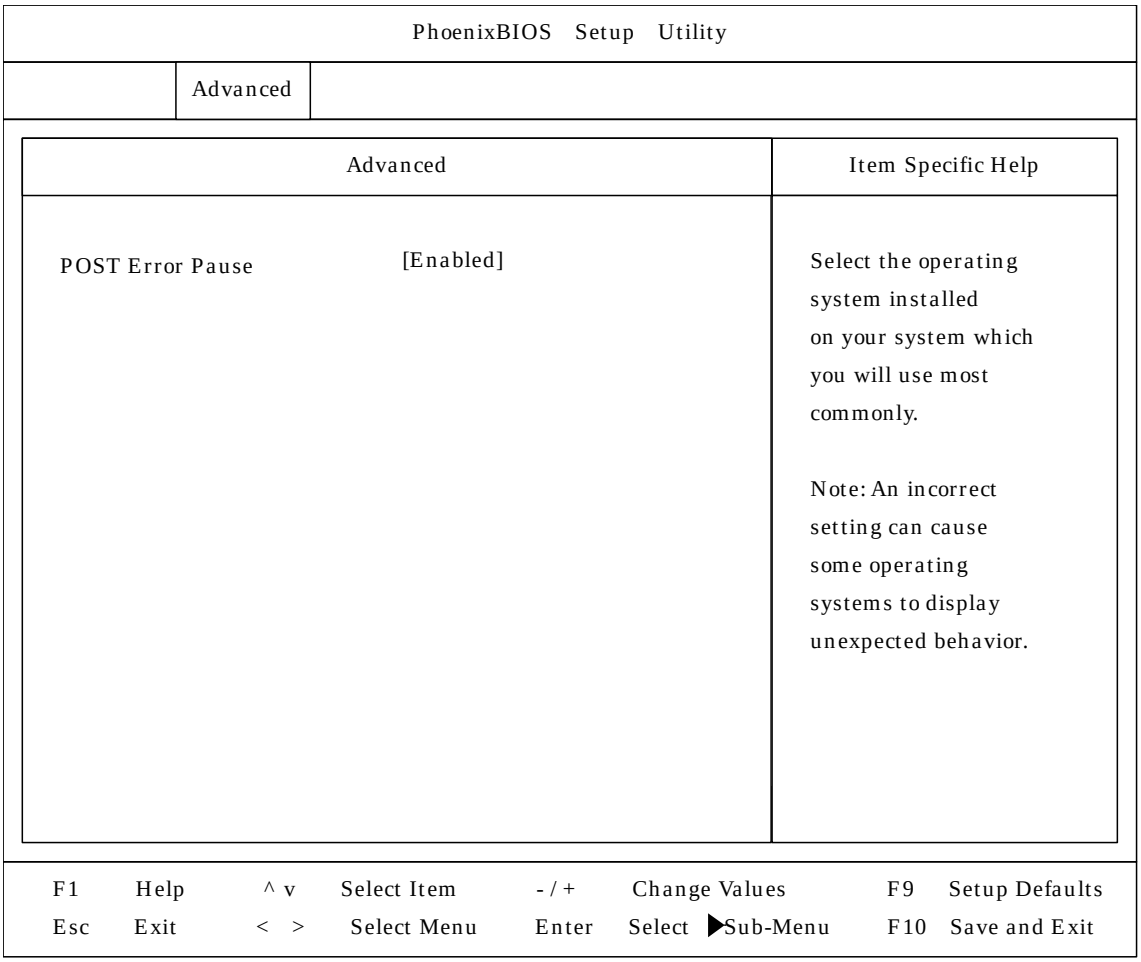

PhoenixBIOS Setup Utility
Advanced
Advanced
Item Specific Help
POST Error Pause
[Enabled]
Select the operating system installed on your system which you will use most commonly.
Note: An incorrect setting can cause some operating systems to display unexpected behavior.
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-4. Advanced Submenu

Table 4-5. Advanced Submenu Options

Menu	Option	Description
POST Error Pause	Disabled [Enabled]	If a non-fatal error occurs during POST (POST will continue), specifies whether the boot process will pause once POST is completed.

[ ]: Default setting

Handling the undetected VGA:
If VGA cannot be detected and serial console redirection is enabled, messages will be displayed on the serial console instead of the display connected with the VGA, and the boot process will continue. If the serial console redirection function is disabled, the following takes place and the boot process continues:

- Error code is displayed on the LCD (Code:9009).
- A BIOS event log of the error code above is collected.
  “9009 Console Device was not found.”

Peripheral Configuration Submenu

When you select “Peripheral Configuration” on the Advanced menu, the following screen appears. For more information on the option functions, refer to “Table 4-6 Peripheral Configuration Submenu.”

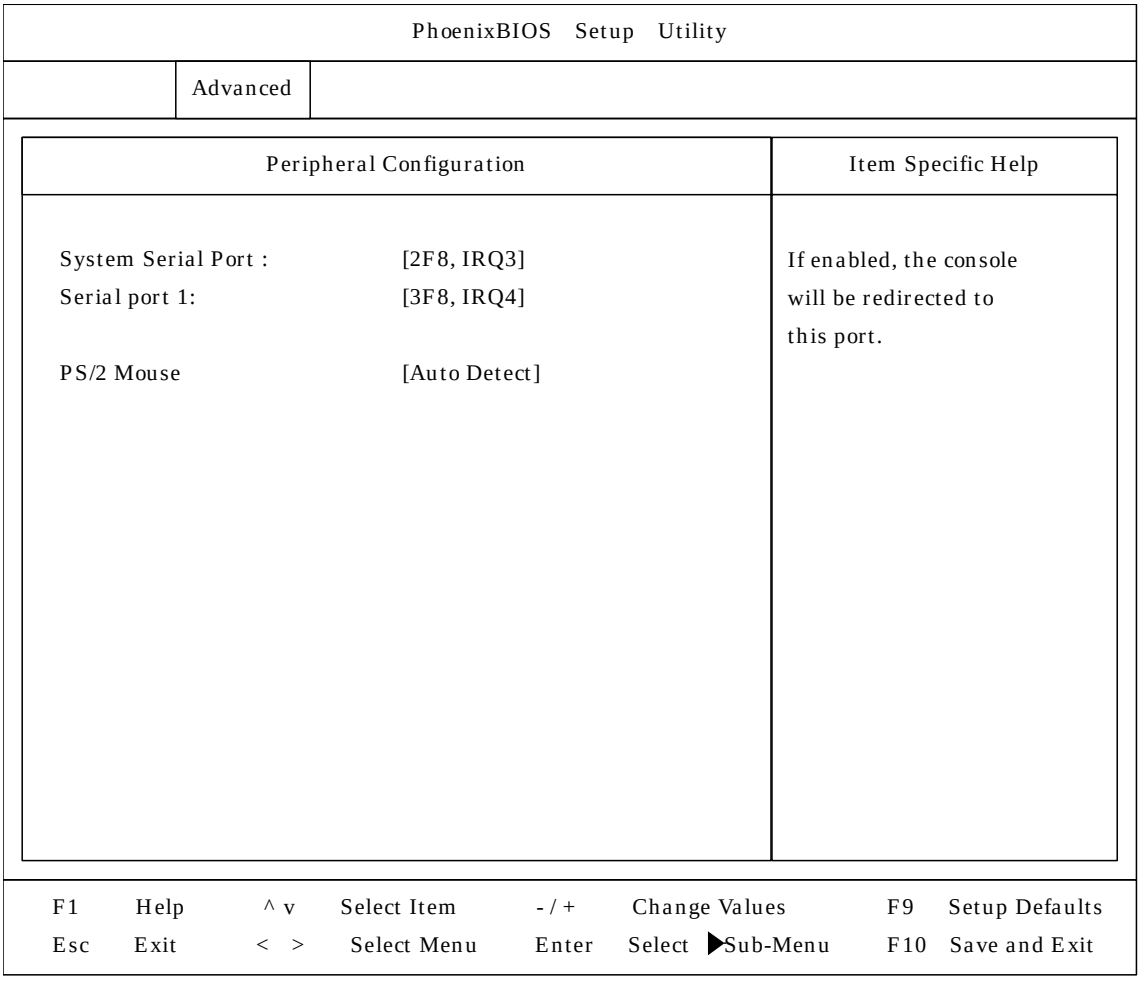

PhoenixBIOS Setup Utility
Advanced
Peripheral Configuration
Item Specific Help
System Serial Port : [2F8, IRQ3]
Serial port 1: [3F8, IRQ4]
PS/2 Mouse [Auto Detect]
If enabled, the console will be redirected to this port.
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-5. Peripheral Configuration Submenu

Table 4-6. Peripheral Configuration Submenu

Menu	Option	Description
System Serial Port	Disabled [2F8,IRQ3] FEB08000,IRQ3 Auto	Disables the system serial port, or specifies the I/O address and interrupt line.
Serial port 1	Disabled [3F8,IRQ4] 3E8,IRQ4 2E8,IRQ4 3F8,IRQ6 3E8,IRQ6 2E8,IRQ6 Auto	Disables the serial port 1, or specifies the I/O address and interrupt line.
PS/2 Mouse	Disable Enable [Auto Detect]	Enables/disables the PS/2 mouse. Automatically becomes enabled if Auto Detect is selected and the PS/2 mouse is connected.

[ ]: Default setting

Monitoring Configuration Submenu

When you select “Monitoring Configuration” on the Advanced menu, the following screen appears. For more information on the option functions, refer to “Table 4-7 Monitoring Configuration Submenu.”

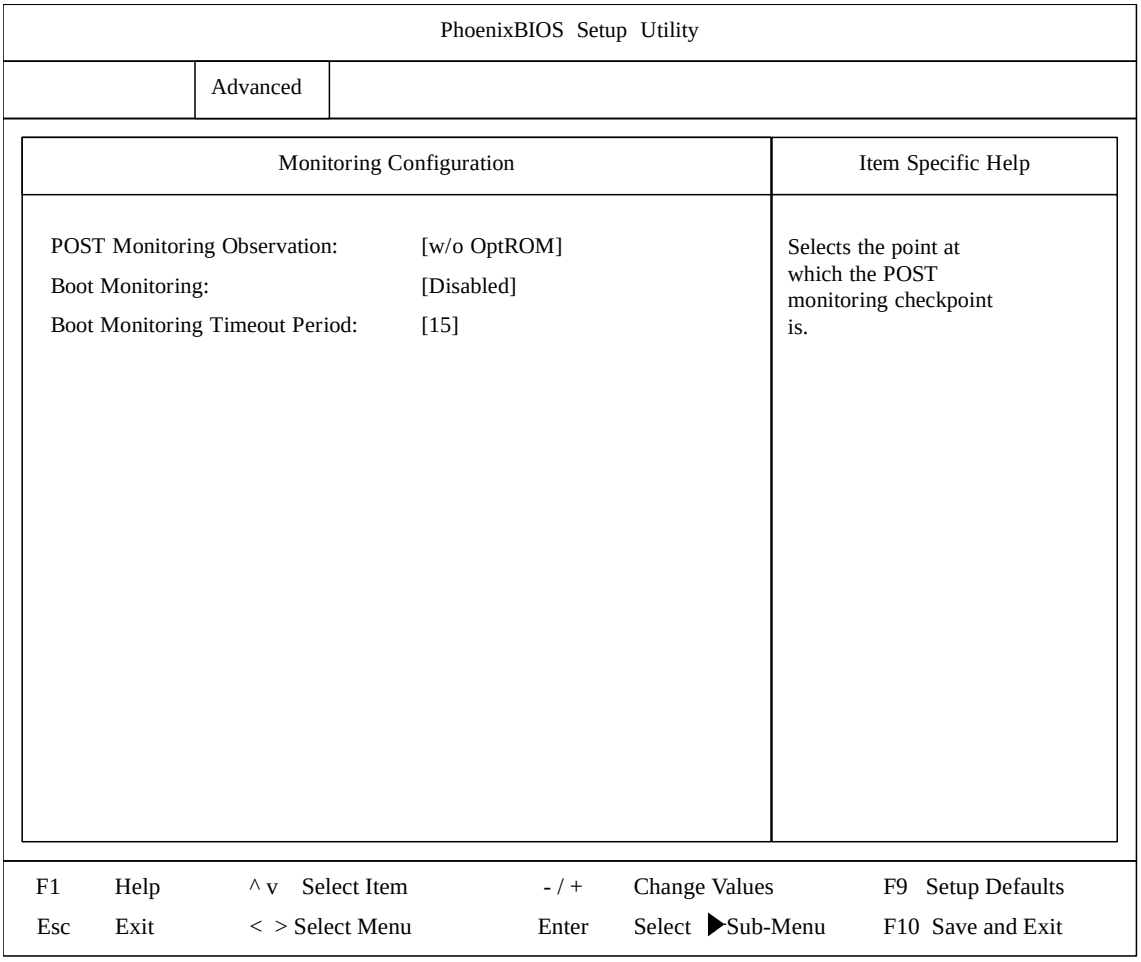

PhoenixBIOS Setup Utility
Advanced
Monitoring Configuration
Item Specific Help
POST Monitoring Observation: [w/o OptROM]
Boot Monitoring: [Disabled]
Boot Monitoring Timeout Period: [15]
Selects the point at which the POST monitoring checkpoint is.
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-6. Monitoring Configuration Submenu

Table 4-7. Monitoring Configuration Submenu

Menu	Option	Description
POST Monitoring Observation	[w/o OptROM] w/ OptROM	Specifies whether to perform stall monitoring during execution of Option ROM in stall monitoring at the BIOS startup. w/ OptROM: Continues stall monitoring during execution of Option ROM. w/o OptROM: Suspends stall monitoring during execution of Option ROM.
Boot Monitoring	[Disabled] Enabled	Specifies whether to perform stall monitoring when EFI AP (e.g. OS) is started from the EFI Boot Manager. If you use this function, install ESMPRO because stall monitoring should be stopped after the OS starts up. Do not use this function if ESMPRO is not installed.
Boot Monitoring Timeout Period	1 ~ [15] ~ 60	Specifies the stall monitoring period (in minutes) at OS startup. This value is effective only if Boot Monitoring is Enabled.

[ ]: Default setting

Option ROM Submenu

When you select “Option ROM” on the Advanced menu, the following screen appears. For more information on the option functions, refer to “Table 4-8 Option ROM Submenu.”

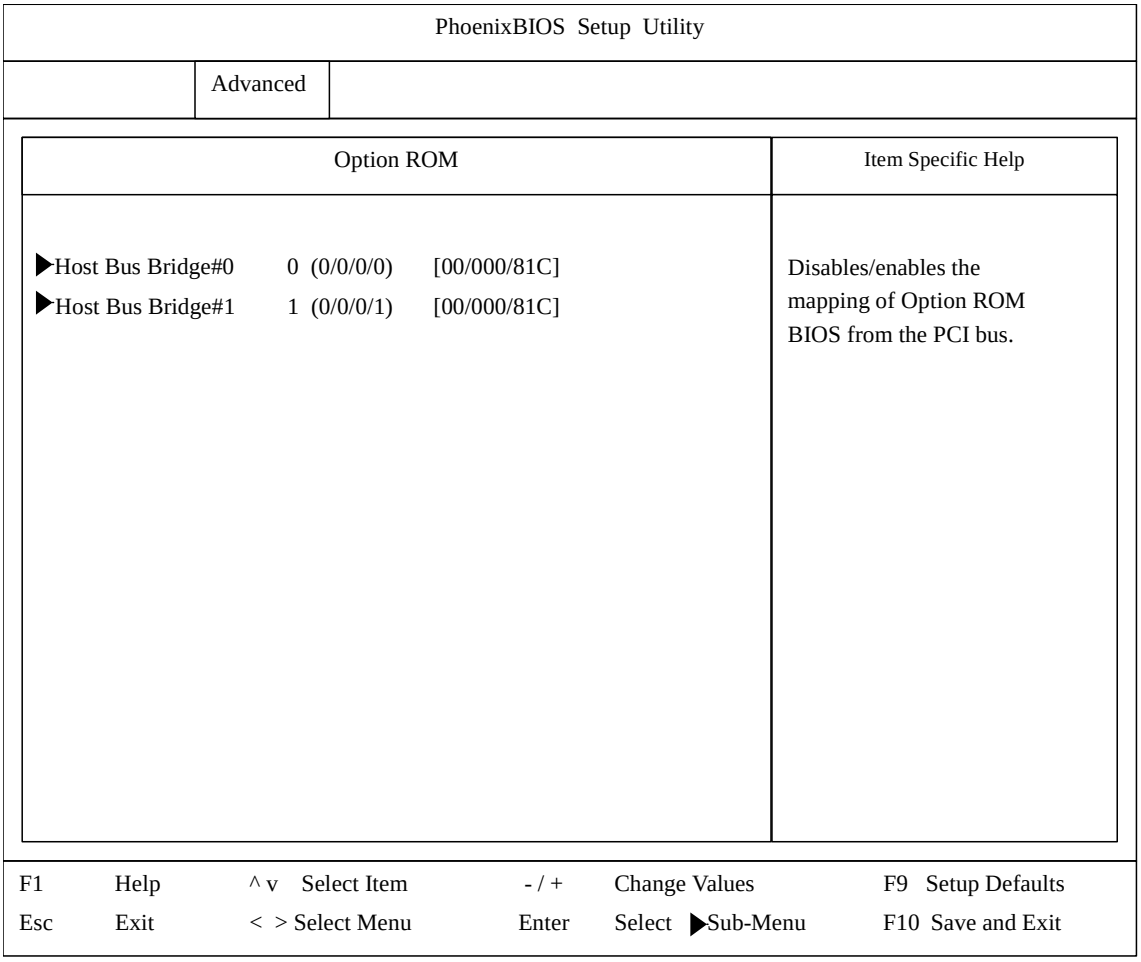

PhoenixBIOS Setup Utility
Advanced
Option ROM
Item Specific Help
▶Host Bus Bridge#0 0 (0/0/0/0) [00/000/81C]
▶Host Bus Bridge#1 1 (0/0/0/1) [00/000/81C]
Disables/enables the mapping of Option ROM BIOS from the PCI bus.
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-7. Option ROM Submenu

Table 4-8. Option ROM Submenu

Menu	Option	Description
Host Bus Bridge#M N (W/X/Y/Z) (aa/bbb/ccc)	--	Specifies whether to operate Option ROM expansion of the PCI device installed under the extended PCI bus. Host Bus Bridge#M N (W/X/Y/Z) (aa/bbb/ccc) M: HBB number (0-63) N: PCI/PCI-X bus number (0-231) W: Cell Board number (0-7) X: IOC number (0-1) Y: GSL number (0-1) Z: PCI bus number (0-1) (aa/bbb/ccc): Location information aa: Cabinet Number bbb: Rack-Mountable Unit Information ccc: Unit/Module Number For more information, refer to “Extended PCI Slot Submenu.” Note: Also see Table 5-2, “PCI Slot Addressing in the PCIX Unit” in Chapter 5.

Extended PCI Slot Submenu

When you select “Extended PCI Slot (Host Bus Bridge#N)” on the Option ROM submenu under the Advanced menu, the following screen appears.

For more information on the option functions, refer to “Table 4-9 Extended PCI Slot Submenu.”

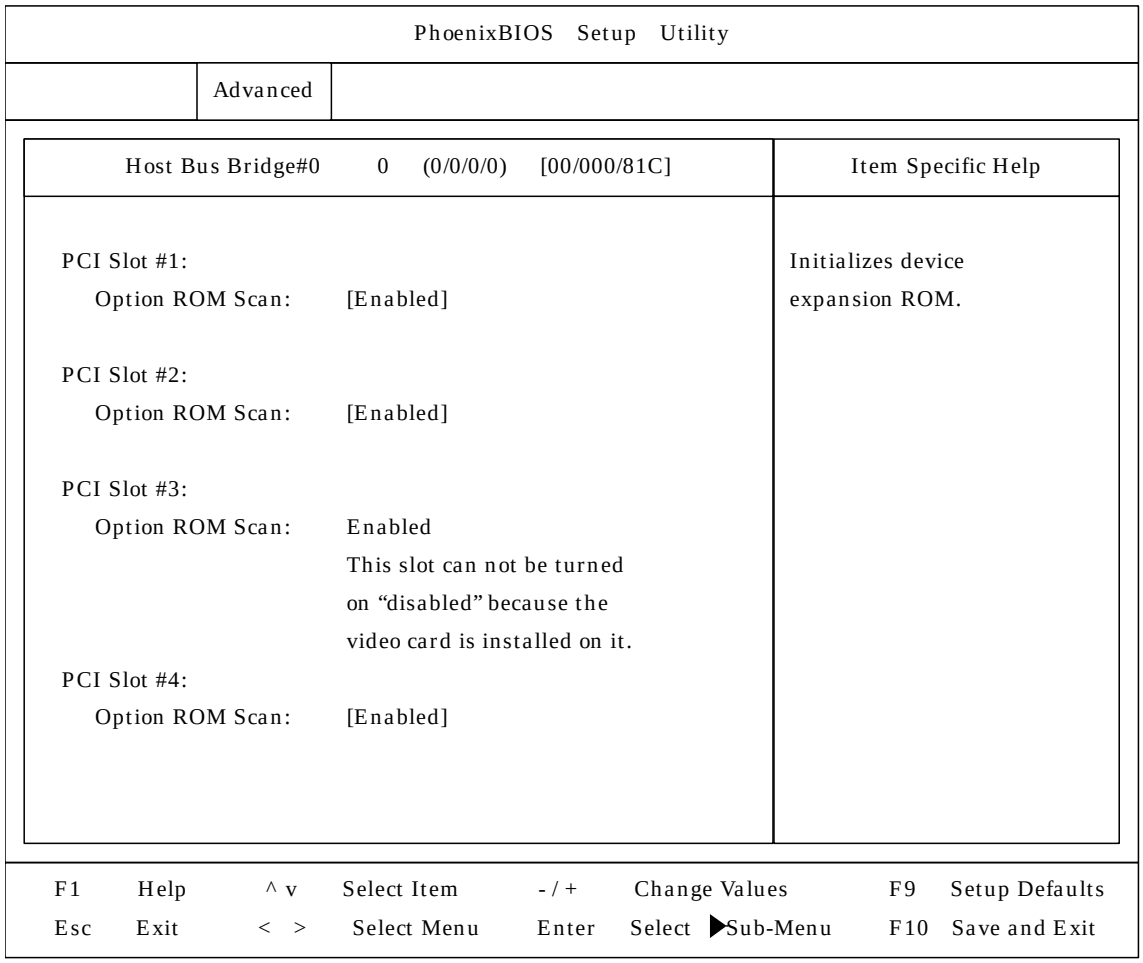

PhoenixBIOS Setup Utility
Advanced
Host Bus Bridge#0 0 (0/0/0/0) [00/000/81C]
Item Specific Help
PCI Slot #1:
Option ROM Scan: [Enabled]
Initializes device expansion ROM.
PCI Slot #2:
Option ROM Scan: [Enabled]
PCI Slot #3:
Option ROM Scan: Enabled
This slot can not be turned on “disabled” because the video card is installed on it.
PCI Slot #4:
Option ROM Scan: [Enabled]
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-8. Extended PCI Slot Submenu

Table 4-9. Extended PCI Slot Submenu

Menu	Option	Description
PCI Slot#1 Option ROM Scan PCI Slot#2 Option ROM Scan PCI Slot#3 Option ROM Scan PCI Slot#4 Option ROM Scan	Disabled [Legacy Enabled] EFI(EBC) Enabled EFI(IPF) Enabled For default values, refer to the description below.	Specifies whether to expand Option ROM expansion of the PCI device installed in PCI Slot#1-4 on the specified PCI bus. Disabled: No Option ROM expansion Legacy Enabled: Option ROM expansion exists (Boots IA32 Oprom.) EFI (EBC) Enabled: Option ROM expansion exists. (Boots EBC EFI driver.) EFI (IPF) Enabled: Option ROM expansion exists. (Boots IPF EFI driver.)

Default value of an Option ROM Scan of the extended PCI slot:
Depending on number of the Option ROM expansion installed on devices, a system startup time delay may occur due to an Option ROM Scan.

If this happens, restrict the slots with the Option ROM of the PCI card enabled as the boot device, and set the default value of the Option ROM Scan of the slot to "Legacy Enabled." For the remaining slots, set the default value to "Disabled."

The default values of Option ROM Scan of the extended PCI slot are shown below.

Table 4-10. Default Values of Extended PCI Slot Option ROM Scan

Target Slot	Default Value	Remarks
All slots under the GSL with the lowest number of the master IOC (All slots under GSL#0a and GSL#0b)	Legacy Enabled	PCI bus #0 and PCI bus #1 *
Slots except above	Disabled	PCI bus #2 and PCI bus with larger number

*When a card with PCI-to-PCI Bridge is configured on GSL#0a and GSL#0b, the BIOS assigns a bus number to PCI bus under the PCI-to-PCI bridge. And this remark is not applicable.

Example:
When a PCI-to-PCI Bridge is configured on the slot under GSL#0b, PCI Bus #0 is assigned to GSL#0a. And PCI Bus #1 and PCI Bus#2 are assigned to PCI bus under GSL#0b. In this case, PCI Bus #3 and larger bus number is assigned to PCI bus under GSL with non lowest number. If a PCI-to-PCI Bridge is configured on PCI Bus #0, this example is not applicable.

Procedure when a video card is installed:

If you disable the Option ROM of the slot where a video card is installed, the VGA console becomes unavailable. In this case, the BIOS proceeds as follows:

In BIOS Setup, “Legacy Enabled” is displayed for the slot where the video card is installed, and “Disabled” cannot be selected.

Under the menu of the slot, the following message is displayed.

Displayed message:

This slot cannot be turned on "disabled" because the video card is installed on it.

Numlock Submenu

When you select “Numlock” on the Advanced menu, the following screen appears. For more information on the option functions, refer to “Table 4-11 Numlock Submenu.”

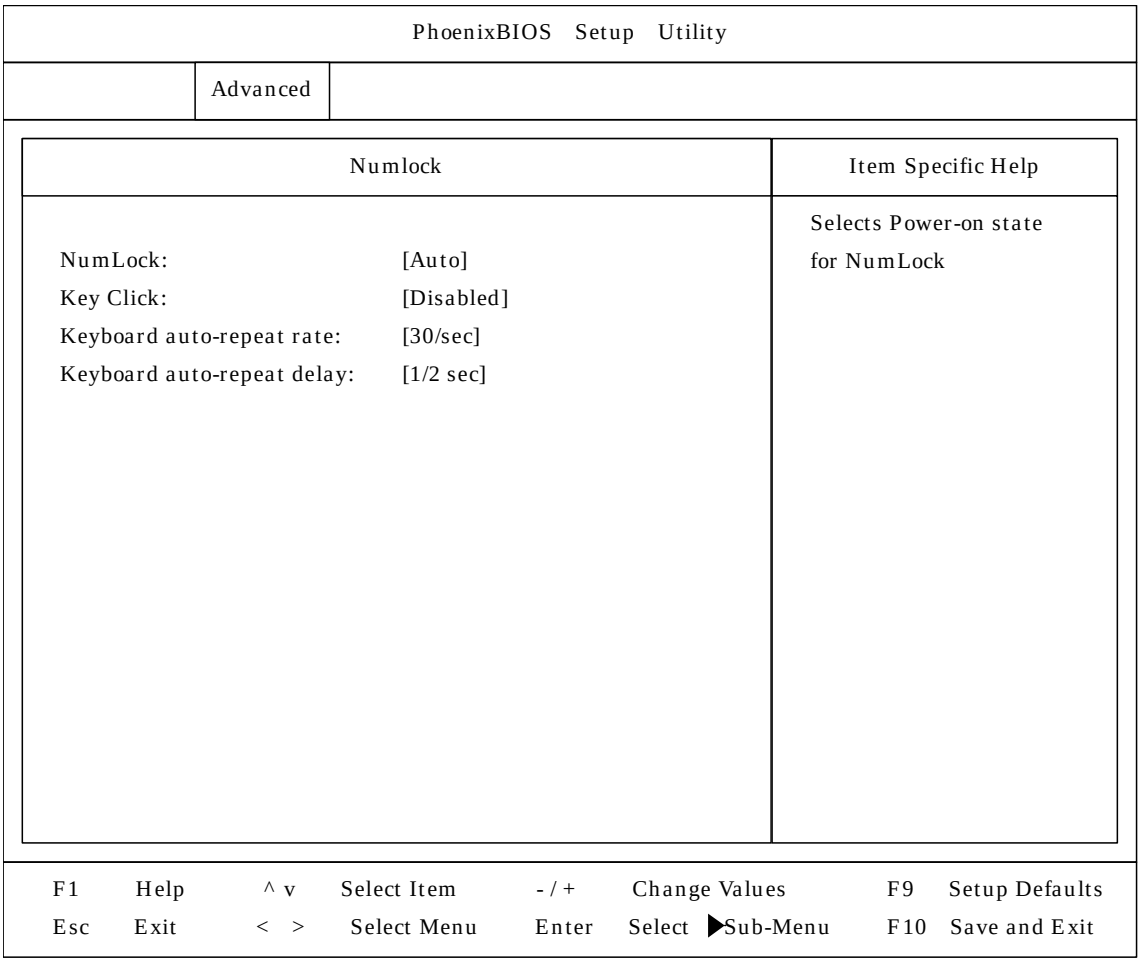

PhoenixBIOS Setup Utility
Advanced
Numlock
Item Specific Help
Selects Power-on state for NumLock
NumLock: [Auto]
Key Click: [Disabled]
Keyboard auto-repeat rate: [30/sec]
Keyboard auto-repeat delay: [1/2 sec]
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-9. Numlock Submenu

Table 4-11. Numlock Submenu

Menu	Option	Description
Numlock	[Auto] On Off	Enables or disables Numlock at system startup. “Auto” enables Numlock when any entry from the numeric keypad is detected.
Key Click	[Disabled] Enabled	Enables or disables key clicks.
Keyboard auto-repeat rate	2/sec 6/sec 10/sec 13.3/sec 18.5/sec 21.8/sec 26.7/sec [30/sec]	Specifies the number of characters to be output for one second of key repeat.
Keyboard auto-repeat delay	1/4 sec [1/2 sec] 3/4 sec 1 sec	Specifies the time until key repeat starts.

[ ]: Default setting

Security Menu

When you move the cursor over “Security” by using the arrow keys (< and >), the Security menu appears. For more information on the option functions, refer to “Table 4-12 Security Menu.”

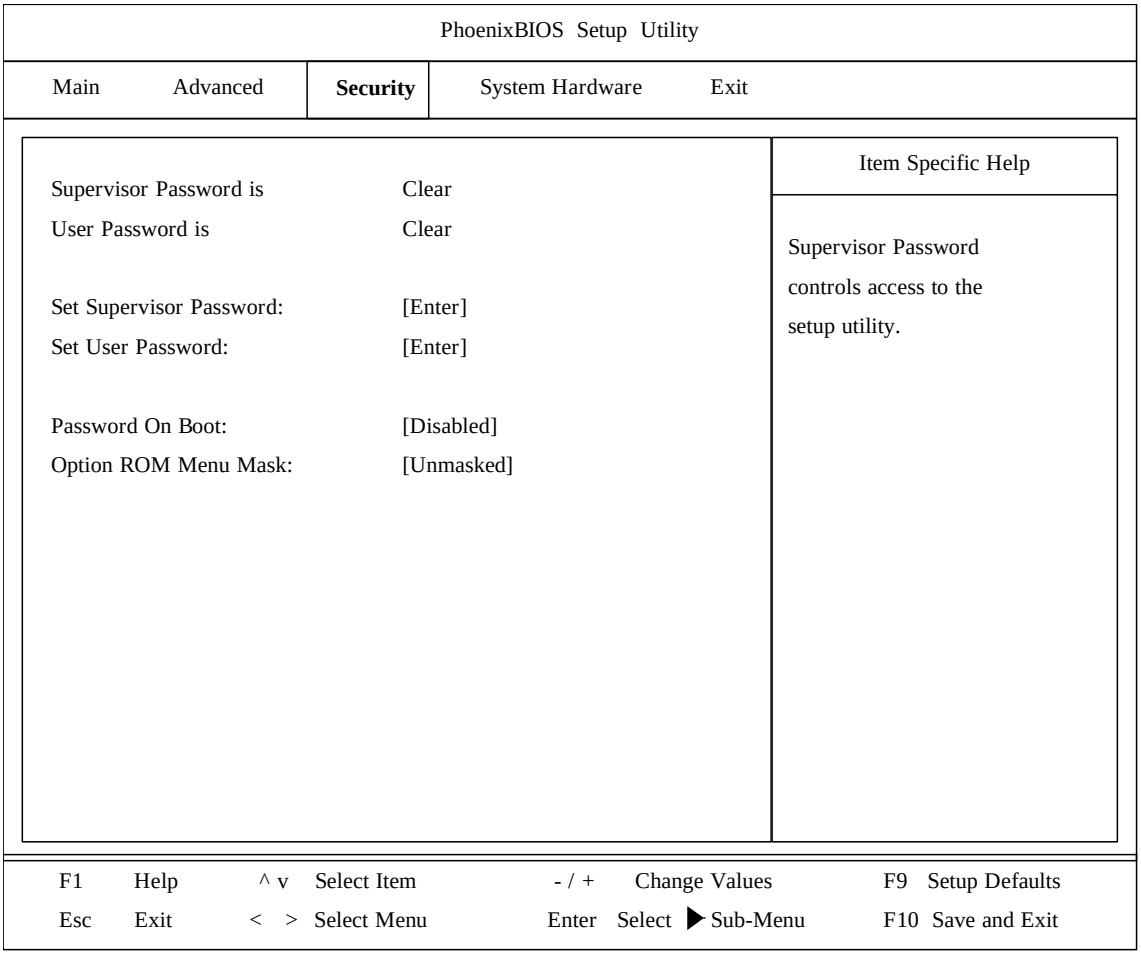


Figure 4-10. Security Menu

The options you can set on the Security menu screen and their functions are shown in the following table.

Table 4-12. Security Menu

Item	Option	Description
Supervisor Password is		Displays whether the supervisor's password is set. The Password is not displayed.
User Password is		Displays whether the user's password is set. The Password is not displayed.
Set Supervisor Password	Up to 7 alphanumeric characters (A-Z, a-z, 0- 9)	Moves to the supervisor password entry screen when you press the "Enter" key. If you log in as a supervisor, you can access all the Setup menus.
Set User Password	Up to 7 alphanumeric characters (A-Z, a-z, 0- 9)	Moves to the user password entry screen when you press the "Enter" key. If you log in as a user, some accesses to the Setup menus are restricted.
Password On Boot	[Disabled] Enabled	Specifies whether a password is required at boot-up. You must have specified the supervisor's password beforehand. If the supervisor's password has been specified and the option "Disabled" is selected, the BIOS judges that a user is trying to boot the system.
Option ROM Menu Mask	[Unmasked] Masked	Enables or disables key entry during Option ROM BIOS expansion. Masked: Disables key entries. Unmasked: Enables key entries.

[ ]: Default setting

System Hardware Menu

When you move the cursor over “System Hardware” by using the arrow keys (< and >), the System Hardware menu appears. For more information on the option functions, refer to “Table 4-13 System Hardware Menu.”

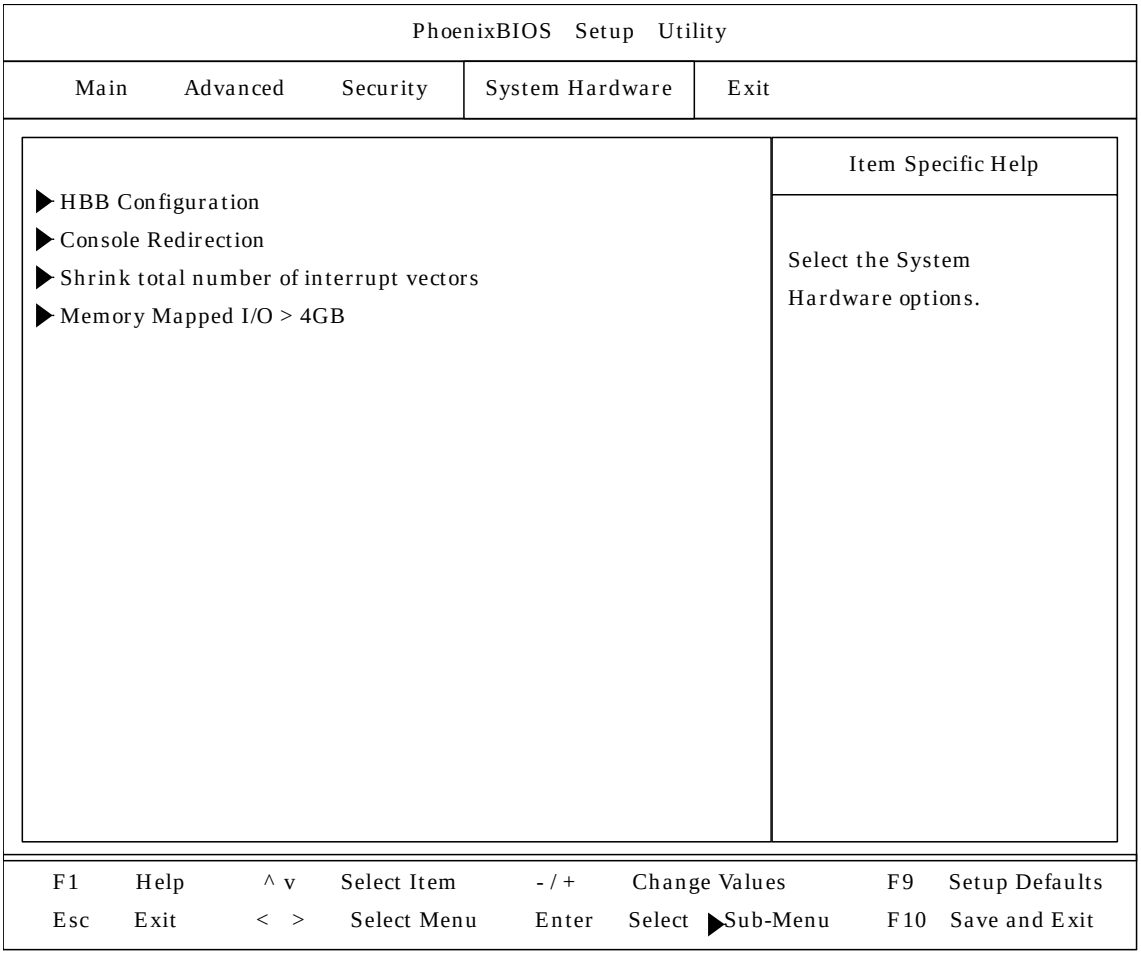


Figure 4-11. System Hardware Menu

The options you can set on the System Hardware menu and their functions are shown in the following table.

Table 4-13. System Hardware Menu

Item	Option	Description
HBB Configuration	--	Specifies Master Latency Timer, PCI Gap, and I/O space for each host PCI bus bridge (HBB: Host Bus Bridge). For more information, refer to “HBB Configuration Submenu.”
Console Redirection	--	Displays/changes the settings of the serial console input/output function. For more information, refer to “Console Redirection Submenu.”
Shrink total number of interrupt vectors	--	Specifies whether to aggregate Global System Interrupt Vectors to 255 or fewer than 255. For more information, refer to “Shrink Total Number of Interrupt Vectors Submenu.”
Memory Mapped I/O > 4GB	--	Specifies whether to map the Memory Mapped I/O to an area of more than 4 GB. For more information, refer to “Memory Mapped I/O>4GB Submenu.”

HBB Configuration Submenu

When you select “HBB Configuration” on the System Hardware menu, the following screen appears. For more information on the option functions, refer to “Table 4-14 HBB Configuration Submenu.”

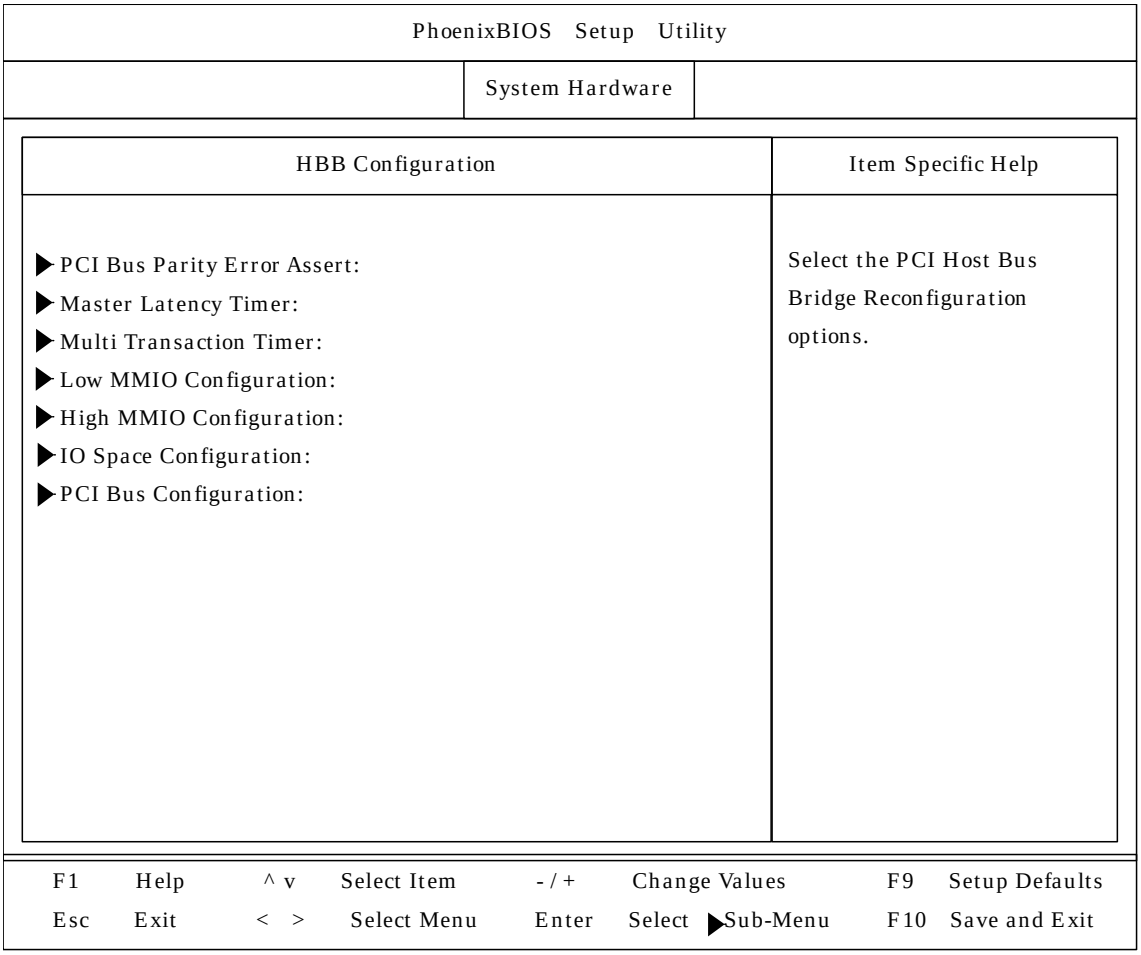

PhoenixBIOS Setup Utility
System Hardware
HBB Configuration
Item Specific Help
PCI Bus Parity Error Assert:
Master Latency Timer:
Multi Transaction Timer:
Low MMIO Configuration:
High MMIO Configuration:
IO Space Configuration:
PCI Bus Configuration:
Select the PCI Host Bus Bridge Reconfiguration options.
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-12. HBB Configuration Submenu

The options you can set on the HBB Configuration submenu and their functions are shown in the following table.

Table 4-14. HBB Configuration Submenu

Item	Option	Description
PCI Bus Parity Error Assert	--	Displays/sets whether to assert PCI bus parity errors in the settings of PCI Parity Error response. For more information, refer to “PCI Bus Parity Error Assert Submenu.”
Master Latency Timer	--	Displays/sets the Master Latency Timer of the host PCI bus bridge. For more information, refer to “Master Latency Timer Submenu.”
Multi Transaction Timer Configuration	--	Displays/sets the Multi Transaction Timer of the host PCI bus bridge. For more information, refer to “Multi Transaction Timer Submenu.”
Low MMIO Configuration	--	Specifies the PCI gap size in the address space less than 4 GB of the host PCI bus bridge. For more information, refer to “Low MMIO Configuration Submenu.”
High MMIO Configuration	--	Specifies the PCI gap size in the address space over 4 GB of the host PCI bus bridge. For more information, refer to “High MMIO Configuration Submenu.”
IO Space Configuration	--	Specifies the I/O space size of the host PCI bus bridge. For more information, refer to “IO Space Configuration Submenu.”
PCI Bus Configuration	--	Specifies the range of PCI bus reserved by the host PCI bus bridge. For more information, refer to PCI Configuration Submenu.”

PCI Bus Parity Error Assert Submenu

When you select “PCI Bus Parity Error Assert” on the HBB Configuration submenu, the following screen appears. For more information on the option functions, refer to “Table 4-15 PCI Bus Parity Error Assert Submenu.”

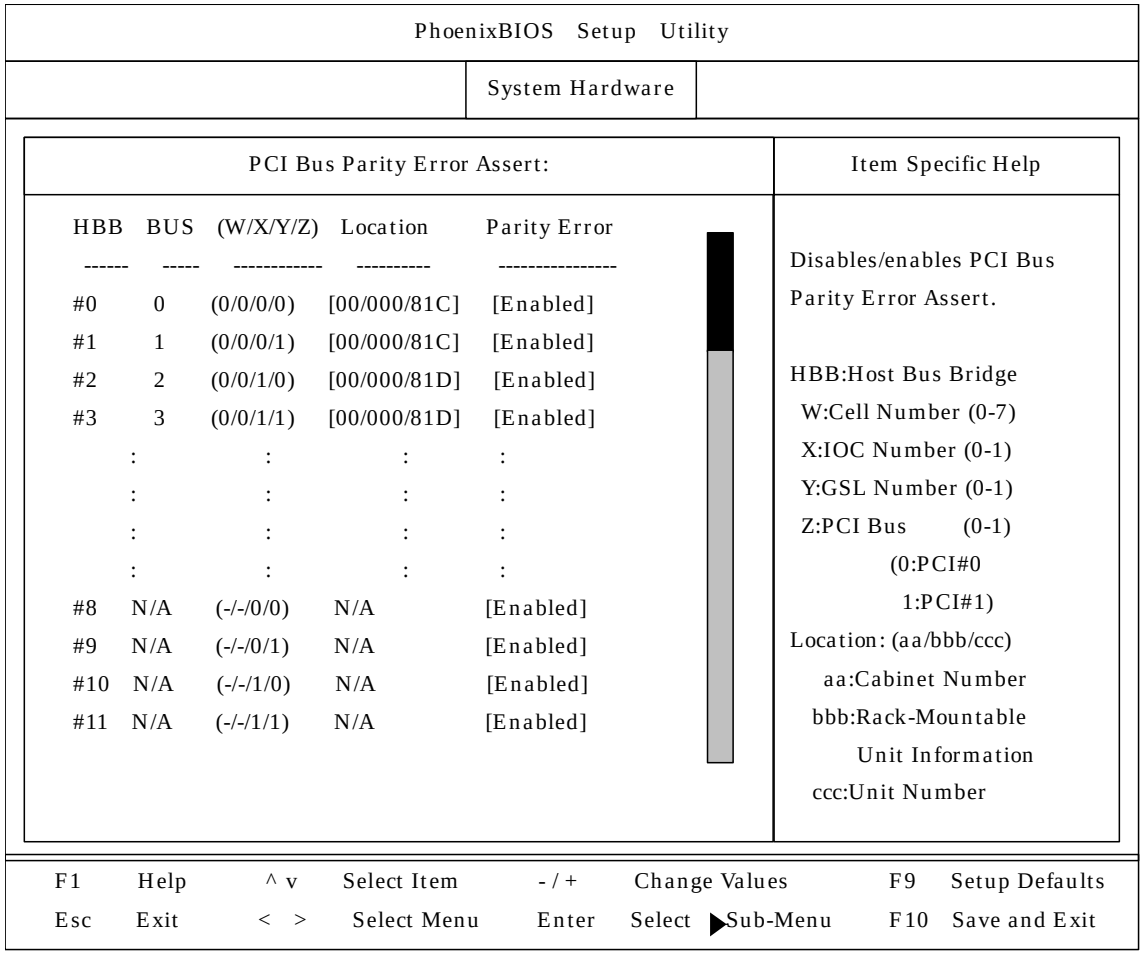

PhoenixBIOS Setup Utility
System Hardware
PCI Bus Parity Error Assert:
Item Specific Help
HBB BUS (W/X/Y/Z) Location Parity Error
#0 0 (0/0/0/0) [00/000/81C] [Enabled]
#1 1 (0/0/0/1) [00/000/81C] [Enabled]
#2 2 (0/0/1/0) [00/000/81D] [Enabled]
#3 3 (0/0/1/1) [00/000/81D] [Enabled]
#8 N/A (-/-/0/0) N/A [Enabled]
#9 N/A (-/-/0/1) N/A [Enabled]
#10 N/A (-/-/1/0) N/A [Enabled]
#11 N/A (-/-/1/1) N/A [Enabled]
Disables/enables PCI Bus Parity Error Assert.
HBB:Host Bus Bridge
W:Cell Number (0-7)
X:IOC Number (0-1)
Y:GSL Number (0-1)
Z:PCI Bus (0-1)
(0:PCI#0
1:PCI#1)
Location: (aa/bbb/ccc)
aa:Cabinet Number
bbb:Rack-Mountable Unit Information
ccc:Unit Number
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-13. PCI Bus Parity Error Assert Submenu

The options you can set on the PCI Bus Parity Assert submenu and their functions are shown in the following table.

Table 4-15. PCI Bus Parity Error Assert Submenu

Item	Option	Description
HBB #N (W/X/Y/Z)	Disabled [Enabled]	HBB #N (W/X/Y/Z): N: HBB number (0 - 63) W: Cell number (0 - 7) X: IOC number (0 - 1) Y: GSL number (0 - 1) Z: PCI bus number (0 - 1) Displays/sets whether to assert the PCI bus parity errors in the settings of the PCI Parity Error response. Enabled: Asserts PCI Parity Errors Disabled: Does not assert PCI Parity Errors

[ ]: Default setting

Master Latency Timer Submenu

When you select “Master Latency Timer” on the HBB Configuration submenu, the following screen appears. For more information on the option functions, refer to “Table 4-16 Master Latency Timer Submenu.”

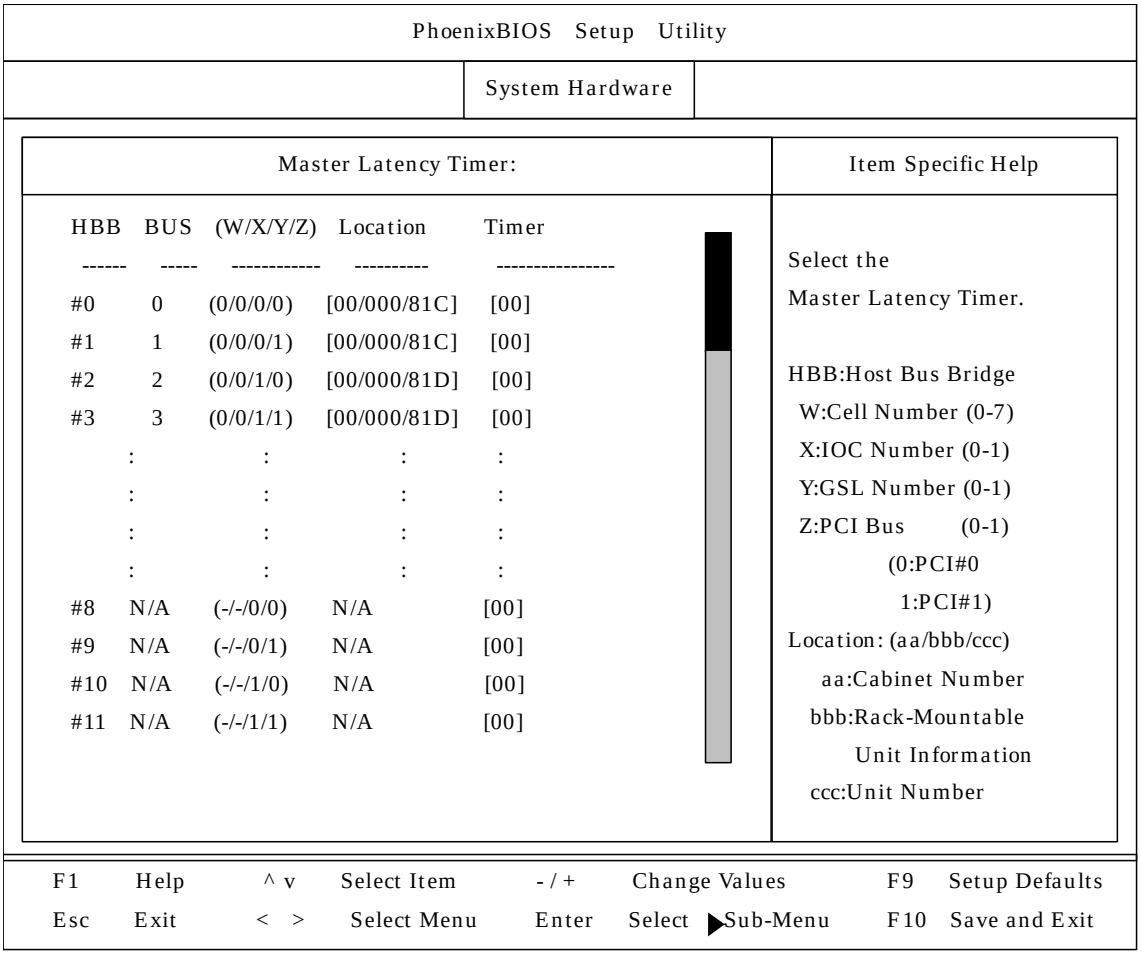


Figure 4-14. Master Latency Timer Submenu

The options you can set on the Master Latency Timer submenu and their functions are shown in the following table.

Table 4-16. Master Latency Timer Submenu

Item	Option	Description
HBB #N (W/X/Y/Z)	[00h] ~ F8h	HBB #N (W/X/Y/Z): N: HBB number (0 - 63) W: Cell number (0 - 7) X: IOC number (0 - 1) Y: GSL number (0 - 1) Z: PCI bus number (0 - 1) Displays/sets the Master Latency Timer of the host PCI bus bridge. Setting values are in units of 8. Press the “+” key to increment it. Press the “–“ key to decrement it.

[ ]: Default setting

Multi Transaction Timer Submenu

When you select ”Multi Transaction Timer” on the HBB Configuration submenu, the following screen appears. For more information on the option functions, refer to “Table 4-17 Multi Transaction Timer Submenu.”

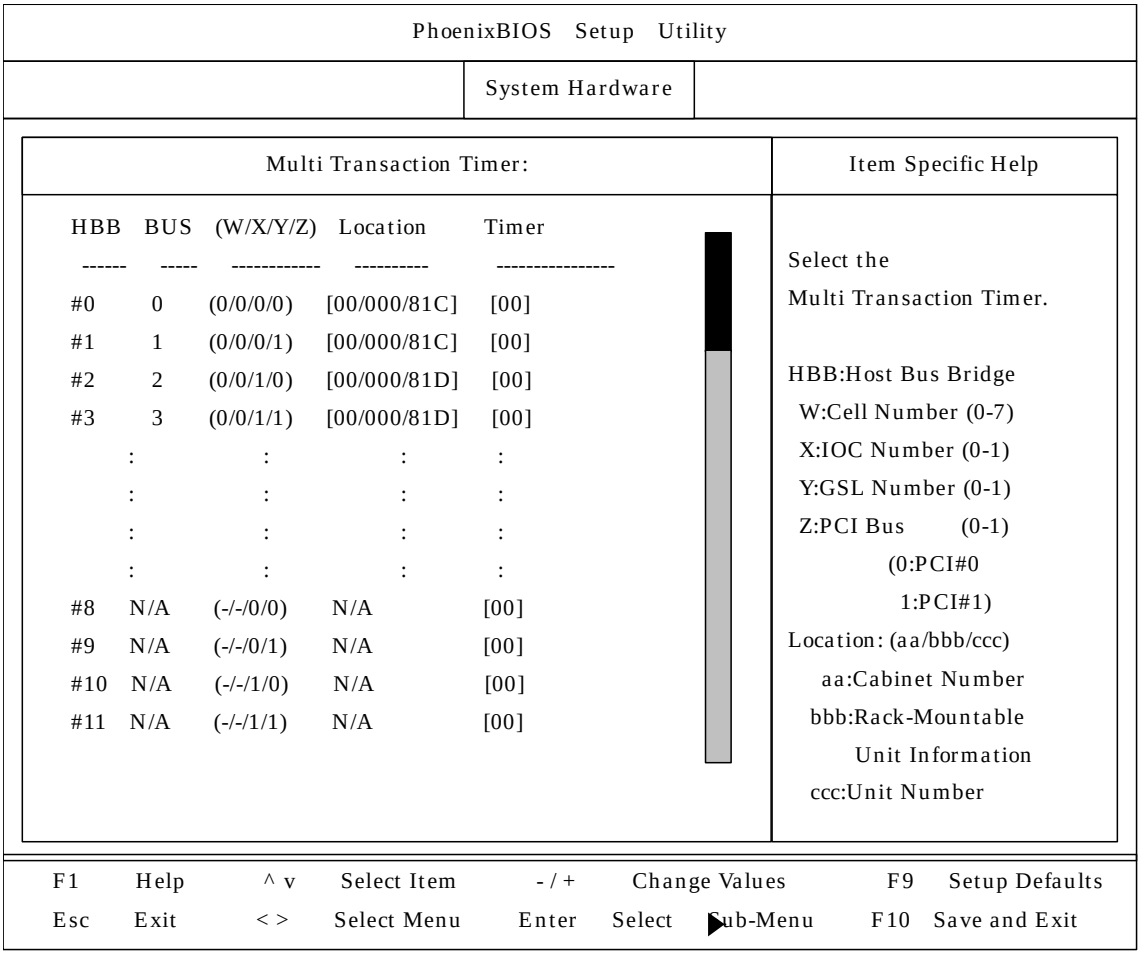


Figure 4-15. Multi Transaction Timer Submenu

Table 4-17. Multi Transaction Timer Submenu

Item	Option	Description
HBB #N (W/X/Y/Z)	[00h] ~ F8h	HBB #N (W/X/Y/Z): N: HBB number (0 - 63) W: Cell number (0 - 7) X: IOC number (0 - 1) Y: GSL number (0 - 1) Z: PCI bus number (0 - 1) Displays/sets the Multi Transaction Timer of the host PCI bus bridge. Setting values are in units of 8. Press the “+” key to increment it. Press the “–“ key to decrement it.

[ ]: Default setting

Low MMIO Configuration Submenu

When you select “Low MMIO Configuration” on the HBB Configuration submenu, the following screen appears. For more information on the option functions, refer to “Table 4-18 Low MMIO Configuration Submenu.”

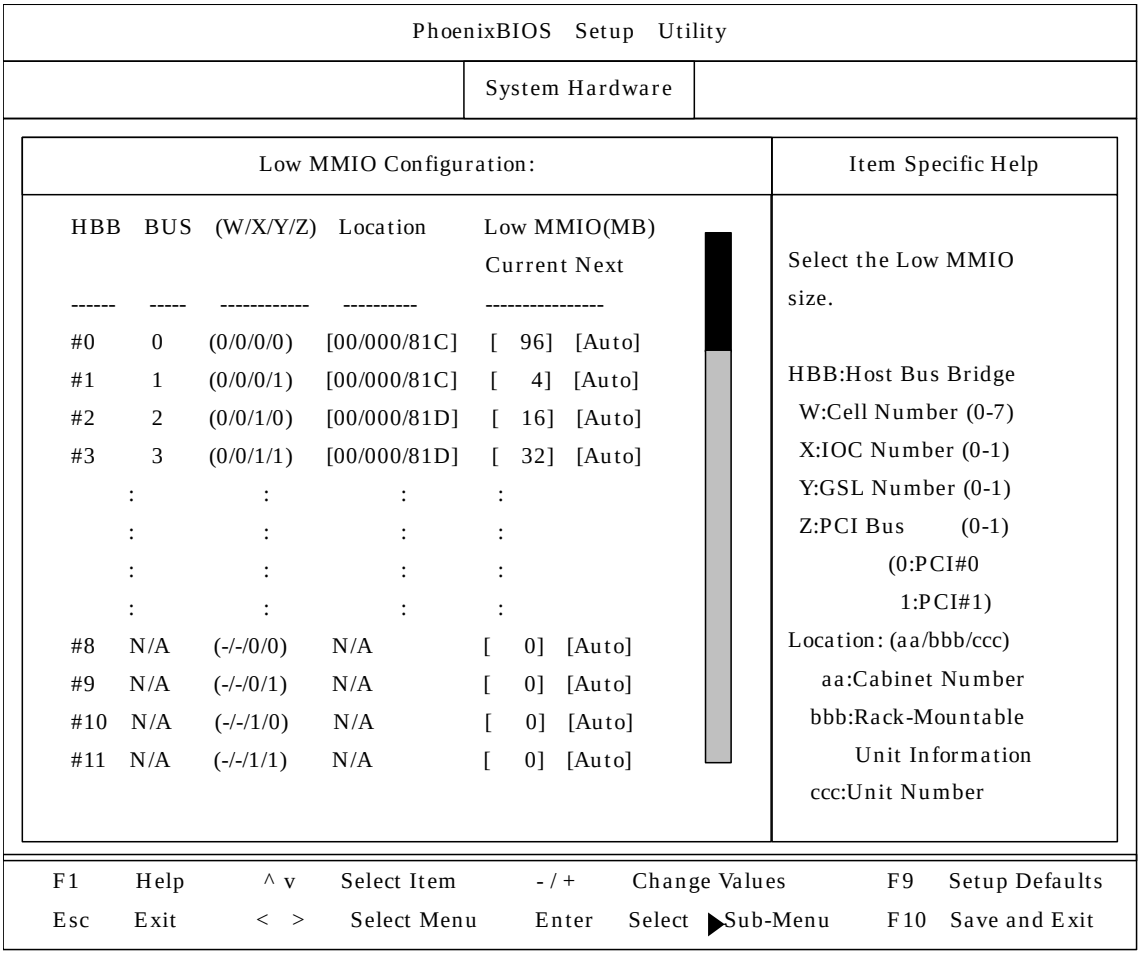

PhoenixBIOS Setup Utility
System Hardware
Low MMIO Configuration:
Item Specific Help
HBB BUS (W/X/Y/Z) Location Low MMIO(MB)
Current Next
#0 0 (0/0/0/0) [00/000/81C] [96] [Auto]
#1 1 (0/0/0/1) [00/000/81C] [4] [Auto]
#2 2 (0/0/1/0) [00/000/81D] [16] [Auto]
#3 3 (0/0/1/1) [00/000/81D] [32] [Auto]
#8 N/A (-/-/0/0) N/A [0] [Auto]
#9 N/A (-/-/0/1) N/A [0] [Auto]
#10 N/A (-/-/1/0) N/A [0] [Auto]
#11 N/A (-/-/1/1) N/A [0] [Auto]
Select the Low MMIO size.
HBB:Host Bus Bridge
W:Cell Number (0-7)
X:IOC Number (0-1)
Y:GSL Number (0-1)
Z:PCI Bus (0-1)
(0:PCI#0
1:PCI#1)
Location: (aa/bbb/ccc)
aa:Cabinet Number
bbb:Rack-Mountable
Unit Information
ccc:Unit Number
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-16. Low MMIO Configuration Submenu

Table 4-18. Low MMIO Configuration Submenu

Item	Option	Description
HBB #N (W/X/Y/Z)	[Auto] 4MB 8MB 16MB 32MB 64MB 128MB 256MB	HBB #N (W/X/Y/Z): N: HBB number (0 - 63) W: Cell Board number (0 - 7) X: IOC number (0 - 1) Y: GSL number (0 - 1) Z: PCI bus number (0 - 1) Displays/sets the PCI gap size of the host PCI bus bridge. Auto: BIOS automatically sets the optimal size. Other than Auto: Select from the pop-up menu.

[ ]: Default setting

When [Auto] is selected, the BIOS detects the PCI devices installed on the host PCI bus bridge. The BIOS automatically sets the optimal PCI Gap size. When the specified PCI Gap size is smaller than the required PCI Gap size for the installed device, the BIOS neglects the specified PCI Gap size and sets the optimal PCI Gap size. When the sum of the specified PCI Gap size is smaller than the total PCI Gap size of the system, a surplus PCI Gap size is used for the host PCI bus bridge with the largest number.

High MMIO Configuration Submenu

When you select “High MMIO Configuration” on the HBB Configuration submenu, the following screen appears. For more information on the option functions, refer to “Table 4-19 High MMIO Configuration Submenu.”

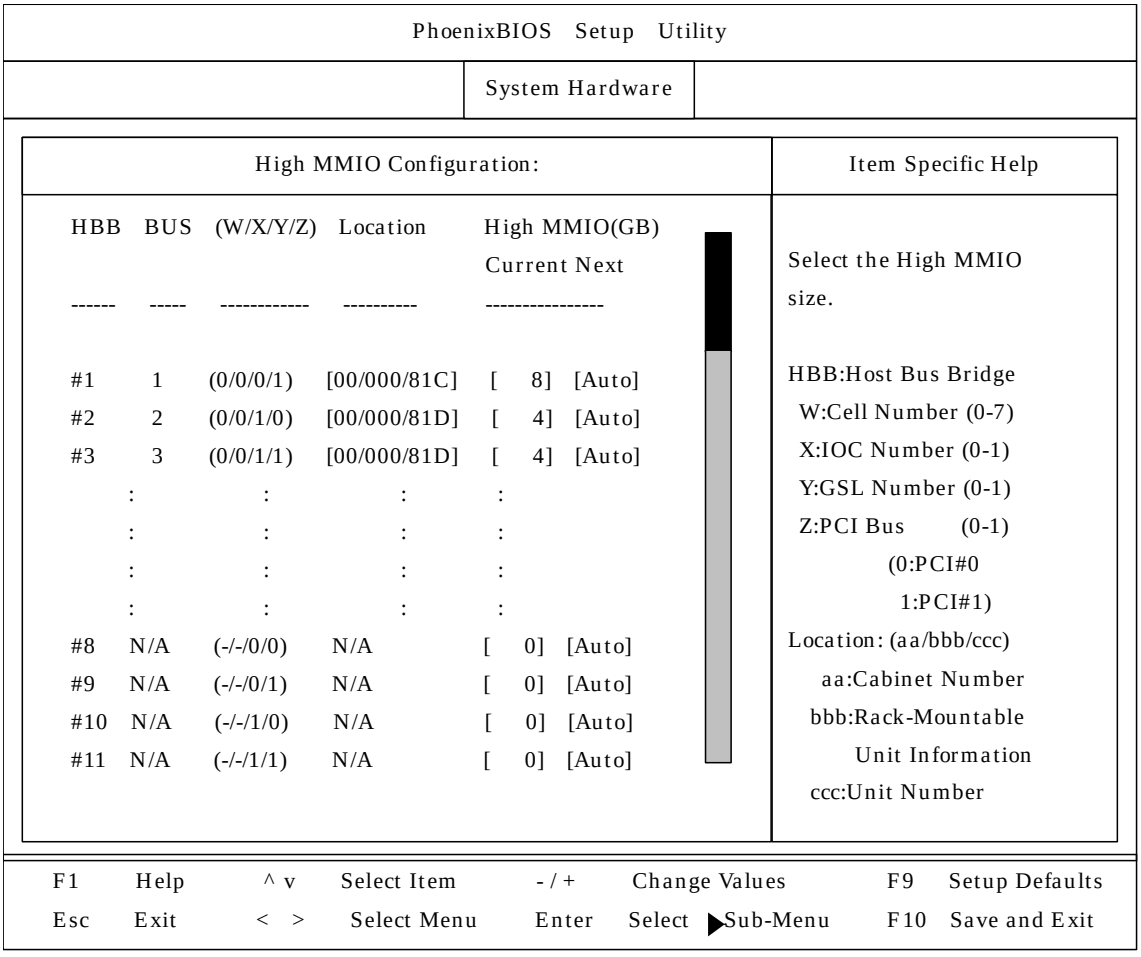

PhoenixBIOS Setup Utility
System Hardware
High MMIO Configuration:
Item Specific Help
HBB BUS (W/X/Y/Z) Location High MMIO(GB)
Current Next
#1 1 (0/0/0/1) [00/000/81C] [8] [Auto]
#2 2 (0/0/1/0) [00/000/81D] [4] [Auto]
#3 3 (0/0/1/1) [00/000/81D] [4] [Auto]
#8 N/A (-/-/0/0) N/A [0] [Auto]
#9 N/A (-/-/0/1) N/A [0] [Auto]
#10 N/A (-/-/1/0) N/A [0] [Auto]
#11 N/A (-/-/1/1) N/A [0] [Auto]
Select the High MMIO size.
HBB:Host Bus Bridge
W:Cell Number (0-7)
X:IOC Number (0-1)
Y:GSL Number (0-1)
Z:PCI Bus (0-1)
(0:PCI#0
1:PCI#1)
Location: (aa/bbb/ccc)
aa:Cabinet Number
bbb:Rack-Mountable
Unit Information
ccc:Unit Number
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-17. High MMIO Configuration Submenu

Table 4-19. High MMIO Configuration Submenu

Item	Option	Description
HBB #N (W/X/Y/Z)	[Auto] 1GB 2GB 4GB 8GB 16GB 32GB 64GB	HBB #N (W/X/Y/Z): N: HBB number (0 - 63) W: Cell Board number (0 - 7) X: IOC number (0 - 1) Y: GSL number (0 - 1) Z: PCI bus number (0 - 1) Displays/sets the PCI gap size of the host PCI bus bridge. Auto: BIOS automatically sets the optimal size. Other than Auto: Select from the pop-up menu.

[ ]: Default setting

When [Auto] is selected, the BIOS detects the PCI devices installed on the host PCI Bus bridge. The BIOS automatically sets the optimal PCI Gap size. When the specified PCI Gap size is smaller than the required PCI Gap size for the installed device, the BIOS neglects the specified PCI Gap size and sets an optimal PCI Gap size

IO Space Configuration Submenu

When you select “IO Space Configuration” on the HBB Configuration submenu, the following screen appears. For more information on the option functions, refer to “Table 4-20 IO Space Configuration Submenu.”

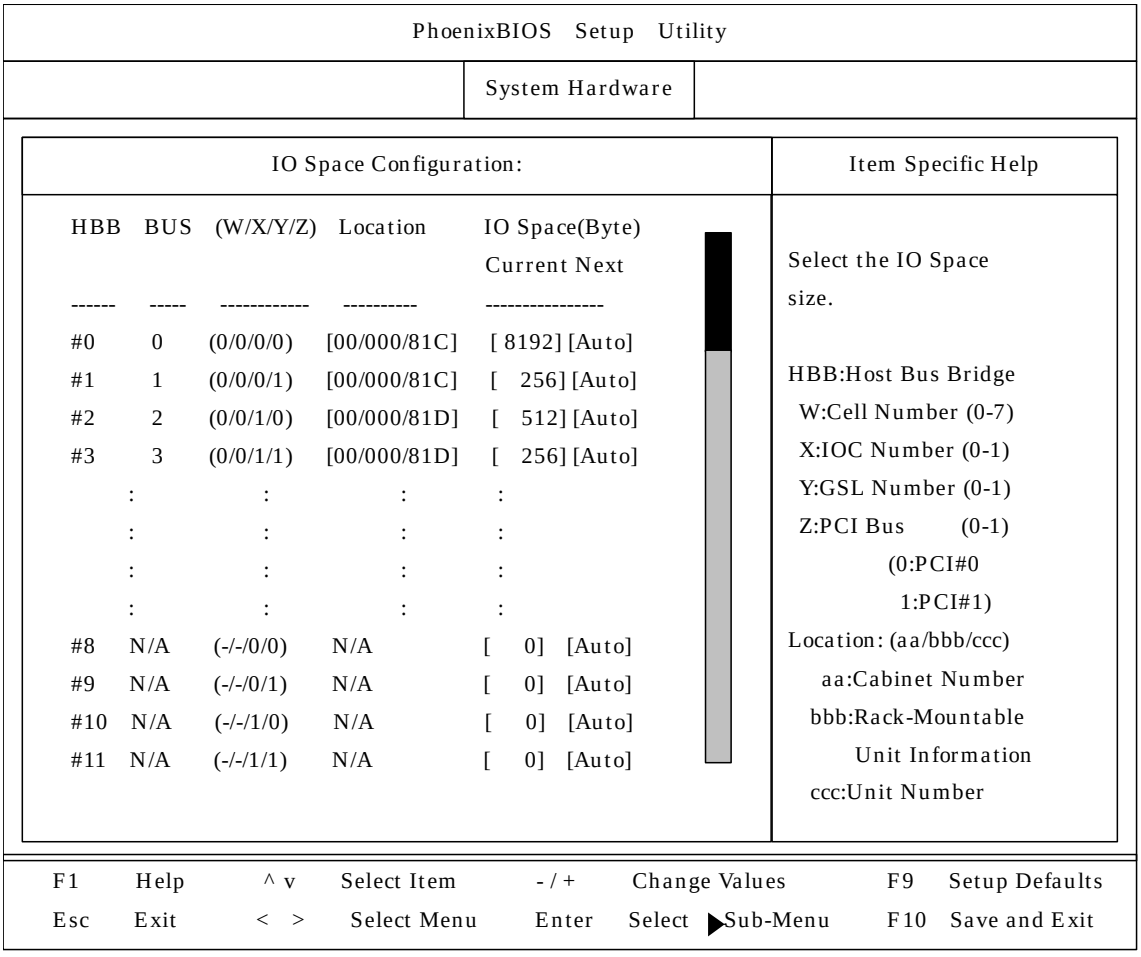

PhoenixBIOS Setup Utility
System Hardware
IO Space Configuration:
Item Specific Help
HBB BUS (W/X/Y/Z) Location IO Space(Byte)
Current Next
#0 0 (0/0/0/0) [00/000/81C] [8192] [Auto]
#1 1 (0/0/0/1) [00/000/81C] [256] [Auto]
#2 2 (0/0/1/0) [00/000/81D] [512] [Auto]
#3 3 (0/0/1/1) [00/000/81D] [256] [Auto]
#8 N/A (-/-/0/0) N/A [0] [Auto]
#9 N/A (-/-/0/1) N/A [0] [Auto]
#10 N/A (-/-/1/0) N/A [0] [Auto]
#11 N/A (-/-/1/1) N/A [0] [Auto]
Select the IO Space size.
HBB:Host Bus Bridge
W:Cell Number (0-7)
X:IOC Number (0-1)
Y:GSL Number (0-1)
Z:PCI Bus (0-1)
(0:PCI#0
1:PCI#1)
Location: (aa/bbb/ccc)
aa:Cabinet Number
bbb:Rack-Mountable
Unit Information
ccc:Unit Number
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-18. IO Space Configuration Submenu

Table 4-20. IO Space Configuration Submenu

Item	Option	Description
HBB #N (W/X/Y/Z)	[Auto] 256Byte 512Byte 1KB 4KB 8KB 16KB	HBB #N (W/X/Y/Z): N: HBB number (0 - 63) W: Cell Board number (0 - 7) X: IOC number (0 - 1) Y: GSL number (0 - 1) Z: PCI bus number (0 - 1) Displays/sets the I/O space size of the host PCI bus bridge. Auto: BIOS automatically sets the optimal size. Other than Auto: Select from the pop-up menu.

[ ]: Default setting

When [Auto] is selected, the BIOS detects the PCI devices installed on the host PCI bus bridge. The BIOS automatically sets the optimal I/O resource size. When the sum of specified I/O resource size is smaller than the I/O resource size of the system (64 KB), a surplus I/O resource size is used for the host PCI bus bridge with the largest number. The sum of the specified I/O resource size must be smaller than 64kB or must be 64kB. If the size is larger than 64kB, the system detects a setting error at the next start up and the I/O resource size settings are initialized. (The procedure is the same as selecting option [Auto].)

PCI Bus Configuration Submenu

When you select “PCI Bus Configuration” on the HBB Configuration submenu, the following screen appears. For more information on the option functions, refer to “Table 4-21 PCI Bus Configuration Submenu.”

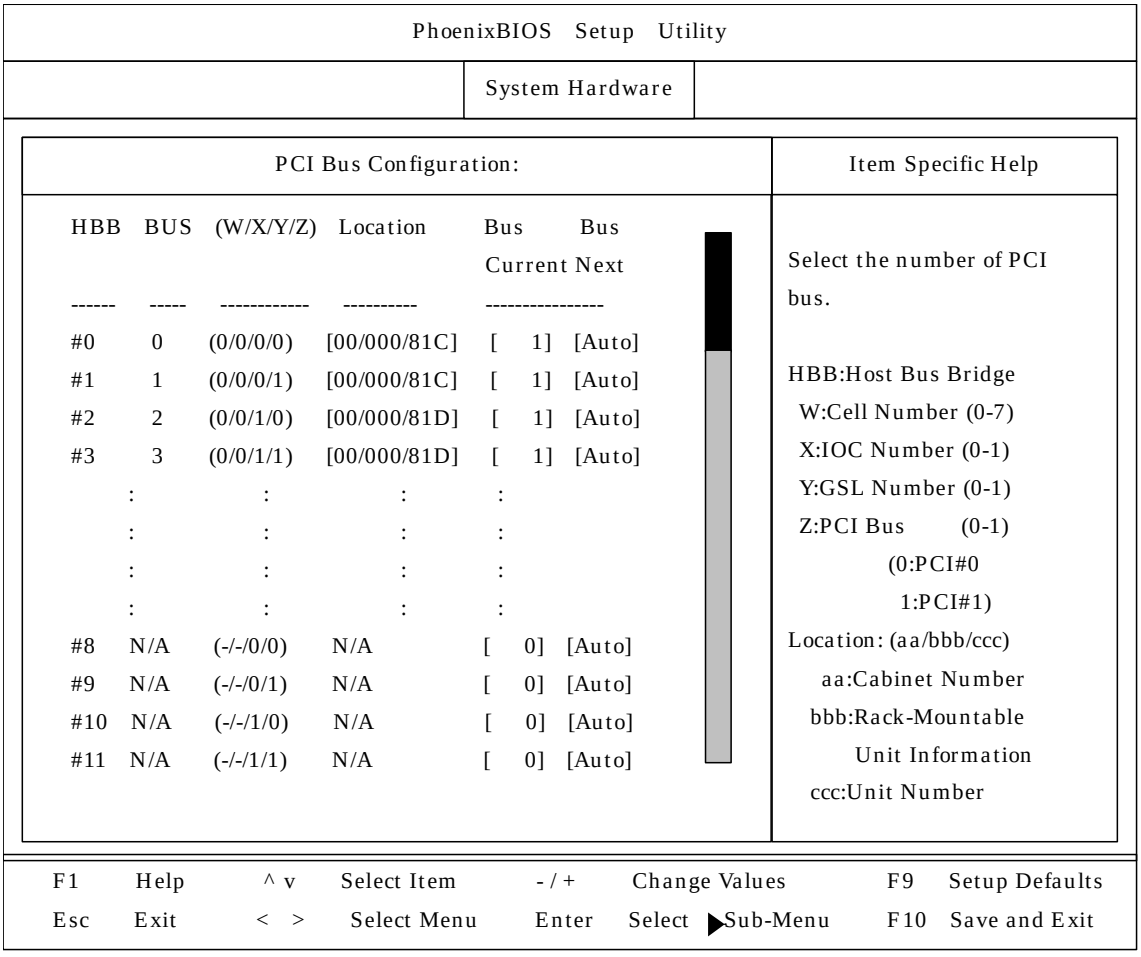

PhoenixBIOS Setup Utility
System Hardware
PCI Bus Configuration:
Item Specific Help
HBB BUS (W/X/Y/Z) Location Bus Bus
Current Next
#0 0 (0/0/0/0) [00/000/81C] [1] [Auto]
#1 1 (0/0/0/1) [00/000/81C] [1] [Auto]
#2 2 (0/0/1/0) [00/000/81D] [1] [Auto]
#3 3 (0/0/1/1) [00/000/81D] [1] [Auto]
#8 N/A (-/-/0/0) N/A [0] [Auto]
#9 N/A (-/-/0/1) N/A [0] [Auto]
#10 N/A (-/-/1/0) N/A [0] [Auto]
#11 N/A (-/-/1/1) N/A [0] [Auto]
Select the number of PCI bus.
HBB:Host Bus Bridge
W:Cell Number (0-7)
X:IOC Number (0-1)
Y:GSL Number (0-1)
Z:PCI Bus (0-1)
(0:PCI#0
1:PCI#1)
Location: (aa/bbb/ccc)
aa:Cabinet Number
bbb:Rack-Mountable
Unit Information
ccc:Unit Number
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-19. PCI Bus Configuration Submenu

Table 4-21. PCI Bus Configuration Submenu

Item	Option	Description
HBB #N (W/X/Y/Z)	[Auto] 1 2 3	HBB #N (W/X/Y/Z): N: HBB number (0 - 63) W: Cell Board number (0 - 7) X: IOC number (0 - 1) Y: GSL number (0 - 1) Z: PCI bus number (0 - 1) Displays/sets the number of the PCI buses supported by the host PCI bus bridge. Auto: BIOS automatically sets the optimal size. Other than Auto: Select from the pop-up menu.

[ ]: Default setting

Console Redirection Submenu

When you select “Console Redirection” on the System Hardware menu, the following screen appears. For more information on the option functions, refer to “Table 4-22 Console Redirection Submenu.”

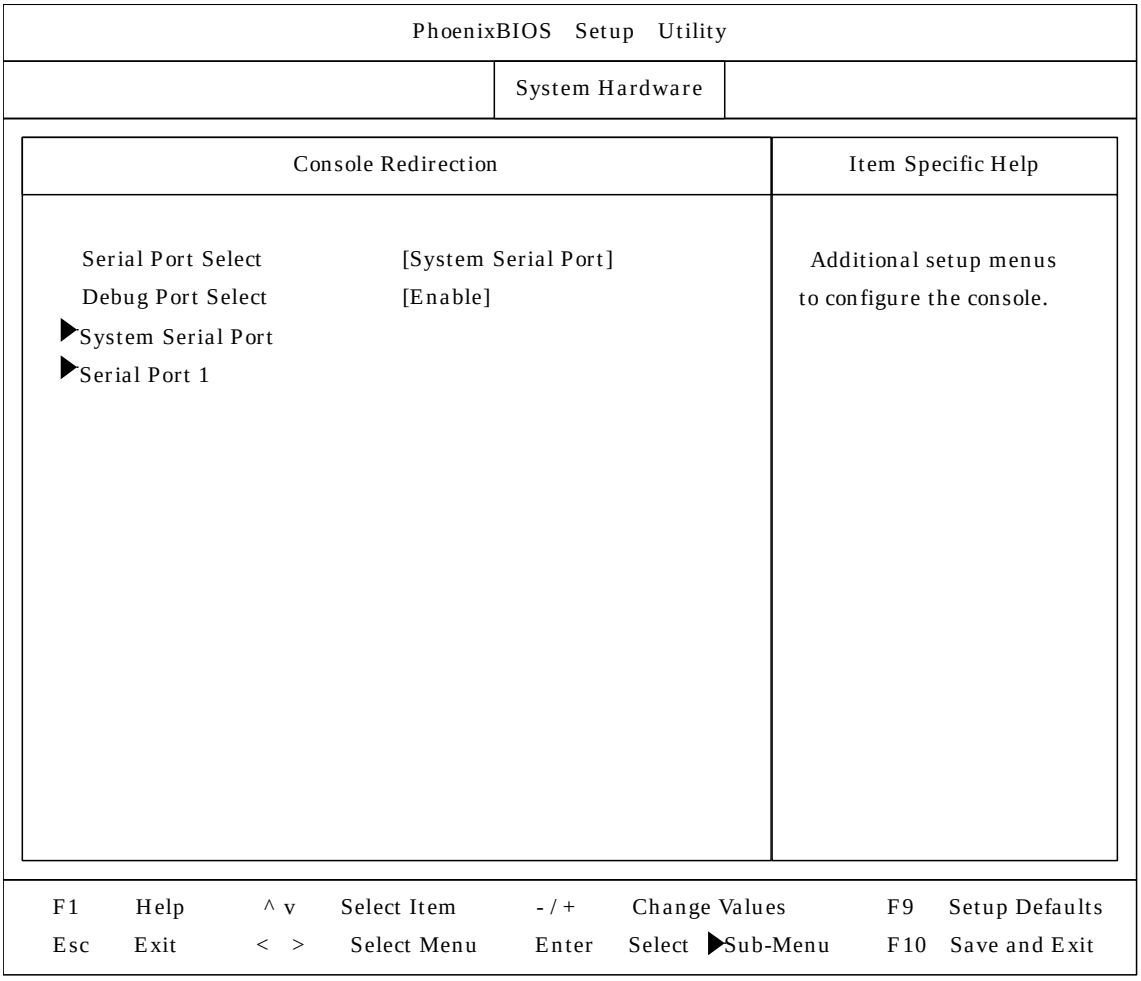

PhoenixBIOS Setup Utility
System Hardware
Console Redirection
Item Specific Help
Serial Port Select
[System Serial Port]
Debug Port Select
[Enable]
System Serial Port
Serial Port 1
Additional setup menus
to configure the console.
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select Sub-Menu F10 Save and Exit

Figure 4-20. Console Redirection Submenu

Table 4-22. Console Redirection Submenu

Item	Option	Description
Serial Port Select	Disable [System Serial Port] Serial Port 1	Specifies the port that uses the serial console function.
Debug Port Select	[Enable] Disable	Specifies whether to use the EFI error display console and OS debug console function. When “Enable” is selected, the serial port described below is selected as the debug port. When “System Serial Port” or “Disable” is selected in the “Serial Port Select”, Serial Port 1 is selected for the debug port. When “Serial Port 1” is selected in the “Serial Port Select”, System Serial Port is selected for the debug port.
System Serial Port		Specifies the Baud Rate, Console Type, and Flow Control to the System Serial Port.
Serial Port 1		Specifies the Baud Rate, Console Type, and Flow Control to Serial Port 1.

[ ]: Default setting

Console Redirection – System Serial Port

When you select “System Serial Port” on the Console Redirection submenu, the following screen appears. For more information on the option functions, refer to “Table 4-23 Console Redirection – System Serial Port Submenu.”

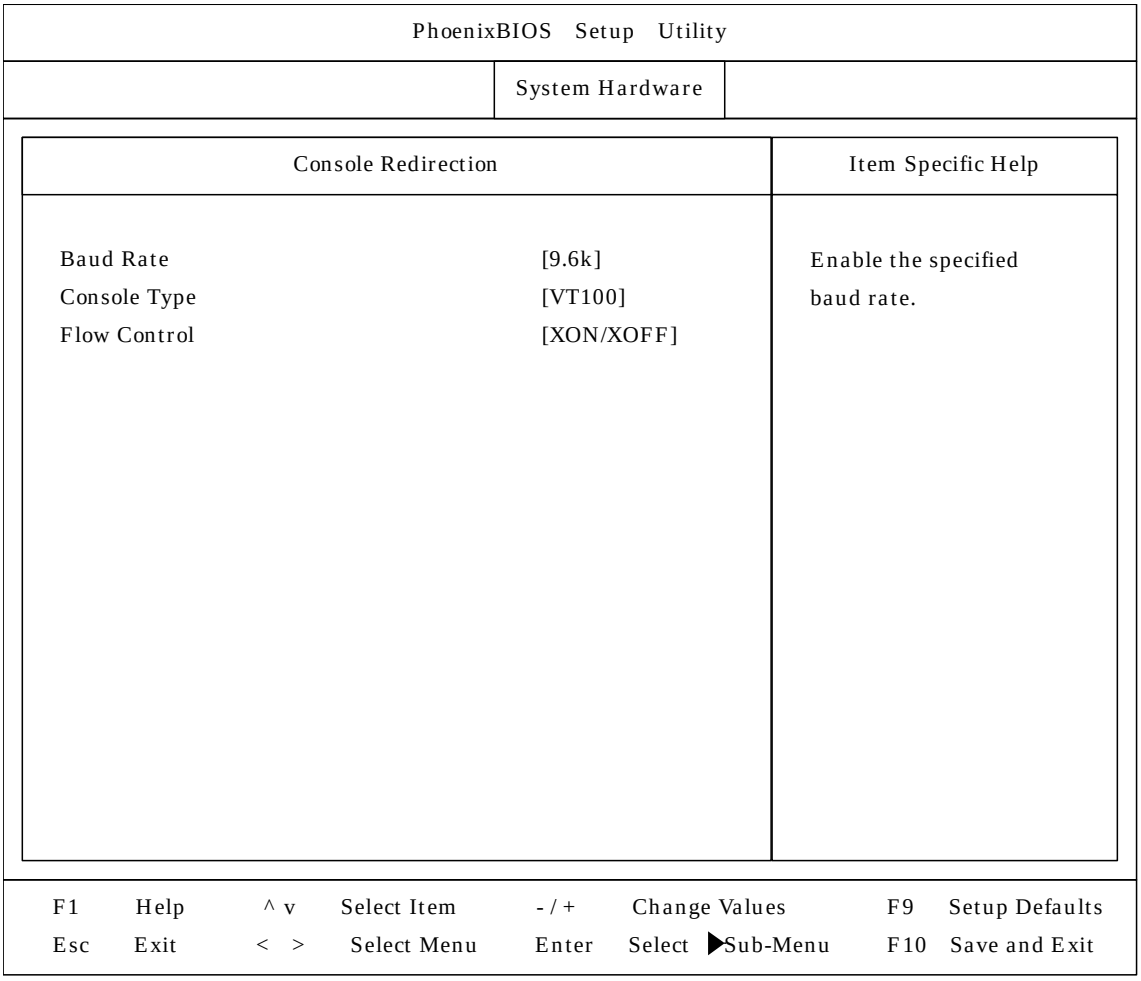


Figure 4-21. Console Redirection – System Serial Port Submenu

Table 4-23. Console Redirection – System Serial Port Submenu

Item	Option	Description
Baud Rate	[9.6K] 19.2K 57.6K 115.2K	Specifies the baud rate.
Console Type	[VT100] VT100,8bit PC ANSI,7bit PC ANSI VT100+ VT-UTF8	Specifies the console type.
Flow Control	No Flow Control [XON/XOFF]	Specifies the flow control mode.

[ ]: Default setting

Console Redirection – Serial Port 1

When you select “Serial Port 1” on the Console Redirection menu, the following screen appears. For more information on the option functions, refer to “Table 4-24 Console Redirection, Serial Port 1 Submenu.”

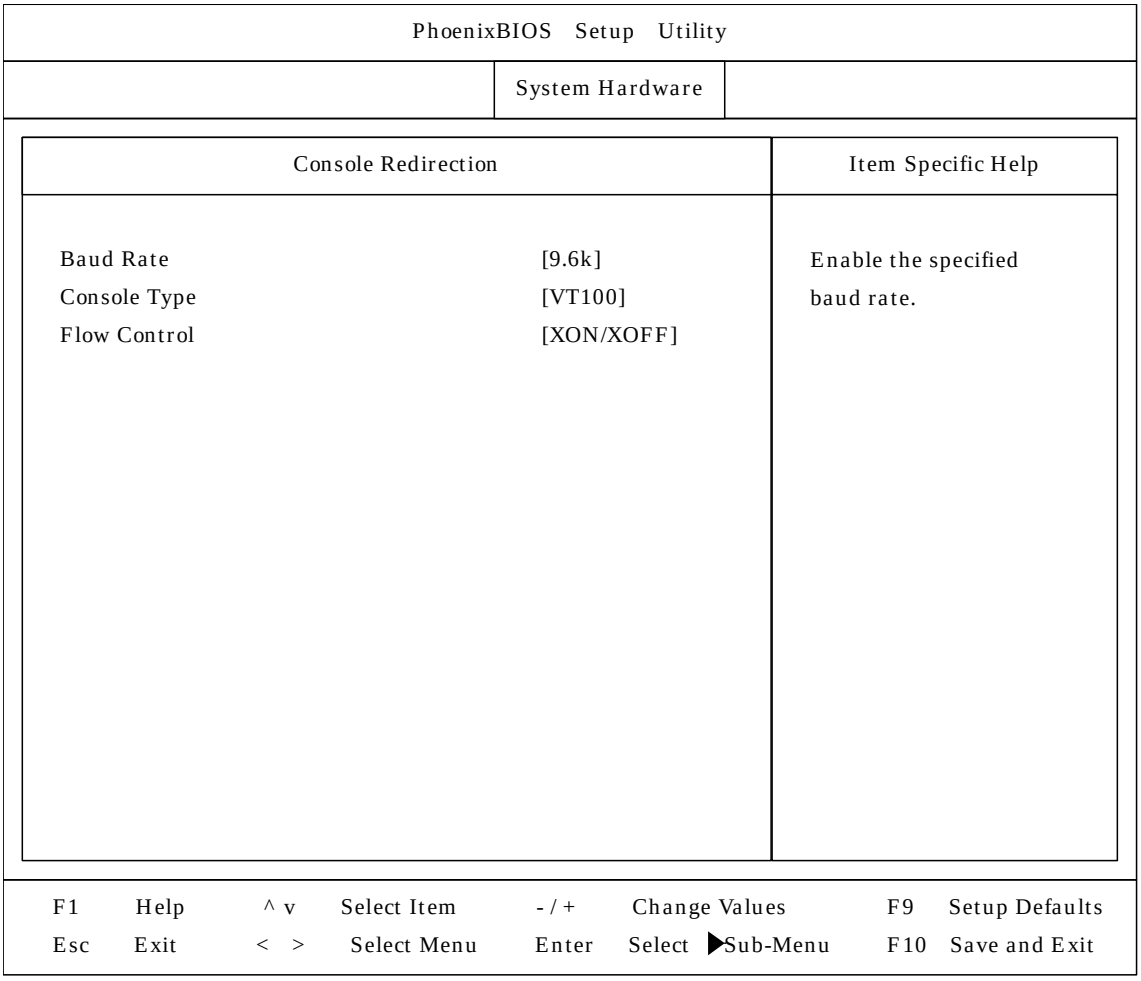


Figure 4-22. Console Redirection – Serial Port 1 Submenu

Table 4-24. Console Redirection – Serial Port 1 Submenu

Item	Option	Description
Baud Rate	[9.6K] 19.2K 57.6K 115.2K	Specifies the baud rate.
Console Type	[VT100] VT100,8bit PC ANSI,7bit PC ANSI VT100+ VT-UTF8	Specifies the console type.
Flow Control	No Flow Control [XON/XOFF] CTS/RTS	Specifies the flow control mode.

[ ]: Default setting

Shrink Total Number of Interrupt Vectors Submenu

When you select “Shrink total number of interrupt vectors” on the System Hardware menu, the following screen appears. For more information on the option functions, refer to “Table 4-25 Shrink Total Number of Interrupt Vectors Submenu.”

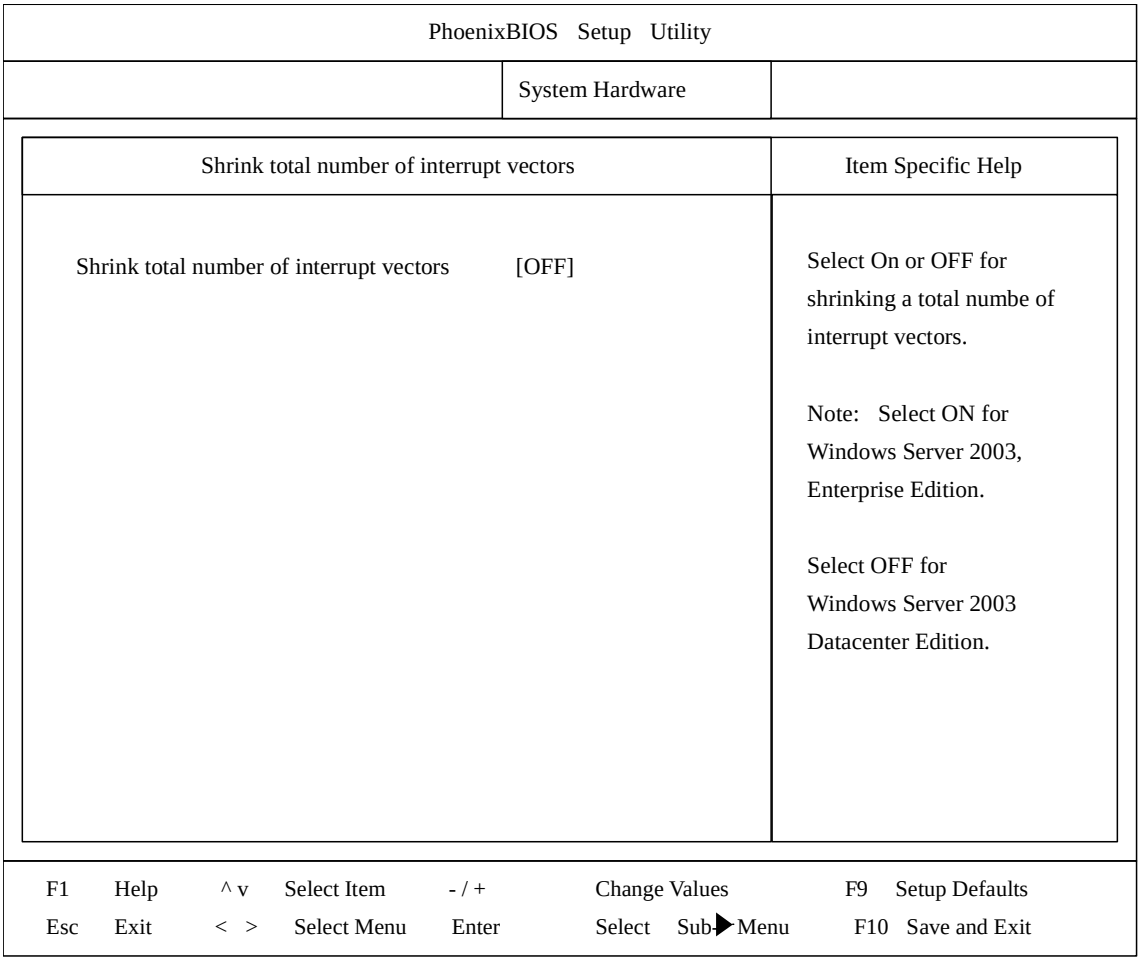

PhoenixBIOS Setup Utility
System Hardware
Shrink total number of interrupt vectors
Item Specific Help
Shrink total number of interrupt vectors [OFF]
Select On or OFF for shrinking a total numbe of interrupt vectors.
Note: Select ON for Windows Server 2003, Enterprise Edition.
Select OFF for Windows Server 2003 Datacenter Edition.
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select Sub-▶ Menu F10 Save and Exit

Figure 4-23. Shrink Total Number of Interrupt Vectors Submenu

Table 4-25. Shrink Total Number of Interrupt Vectors Submenu

Item	Option	Description
Shrink total number of interrupt vectors	ON [OFF]	Specifies whether to aggregate Global System Interrupt Vectors to 255 or fewer than 255. Select ON for Windows Server 2003, Enterprise Edition. Select OFF for Windows Server 2003, Datacenter Edition.

[ ]: Default setting

Memory Mapped I/O > 4GB Submenu

When you select “Memory Mapped I/O > 4GB” on the System Hardware menu, the following screen appears. For more information on the option functions, refer to “Table 4-26 Memory Mapped I/O > 4GB Submenu.”

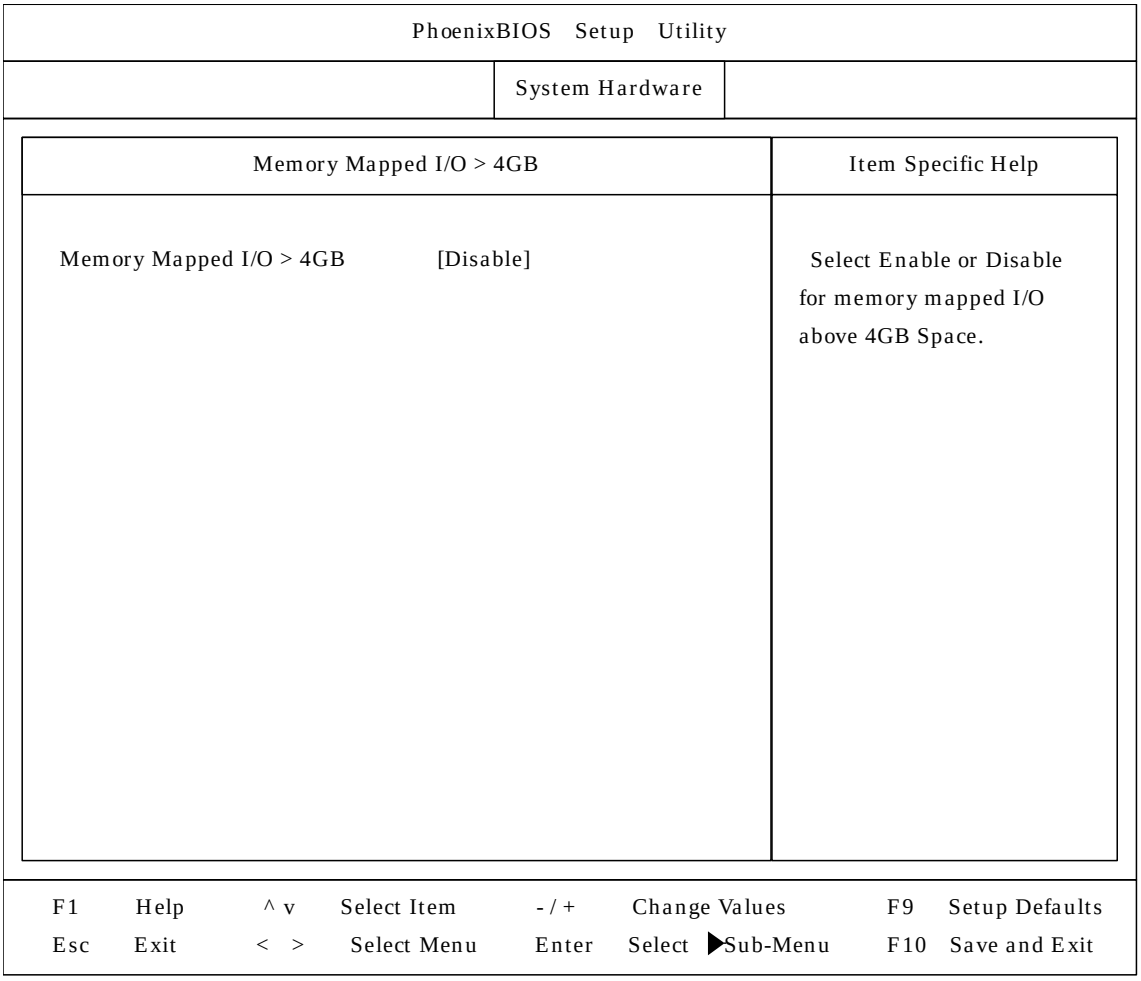

PhoenixBIOS Setup Utility
System Hardware
Memory Mapped I/O > 4GB
Item Specific Help
Memory Mapped I/O > 4GB [Disable]
Select Enable or Disable for memory mapped I/O above 4GB Space.
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-24. Memory Mapped I/O > 4GB Submenu

Table 4-26. Memory Mapped I/O > 4GB Submenu

Item	Option	Description
Memory Mapped I/O > 4GB	Enable [Disable]	Specifies whether to map the Memory Mapped I/O to an area of more than 4 GB.

[ ]: Default setting

Exit Menu

When you move the cursor over “Exit” by using the arrow keys (<- ->), the Exit menu appears. For more information on the option functions, refer to “Table 6-27 Options Displayed on the Exit Menu.”

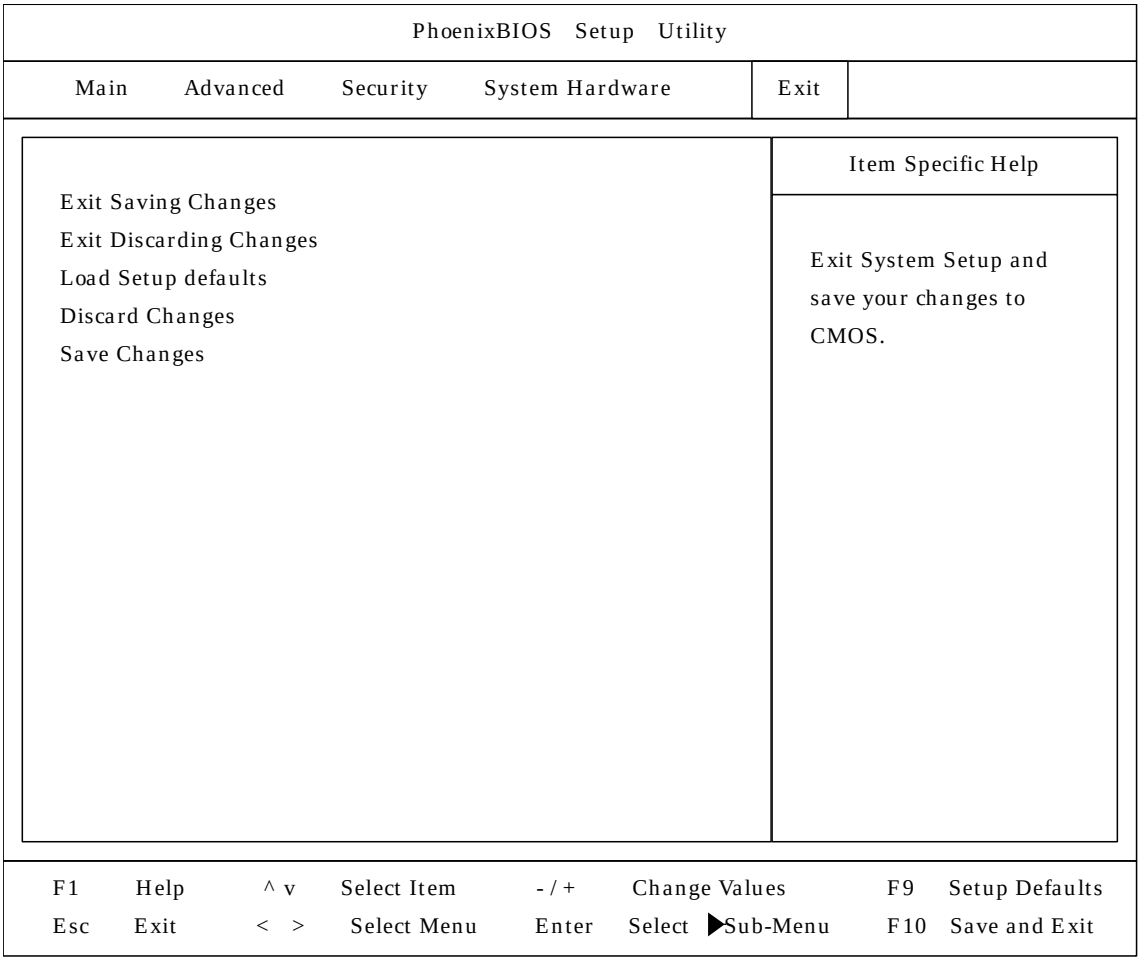

PhoenixBIOS Setup Utility
Main Advanced Security System Hardware Exit
Item Specific Help
Exit Saving Changes
Exit Discarding Changes
Load Setup defaults
Discard Changes
Save Changes
Exit System Setup and save your changes to CMOS.
F1 Help ^ v Select Item - / + Change Values F9 Setup Defaults
Esc Exit < > Select Menu Enter Select ▶Sub-Menu F10 Save and Exit

Figure 4-25. Exit Menu

Table 4-27. Exit Menu

Item	Option	Description
Exit Saving Changes	—	Saves the changes to the settings and exits from Setup. Select this item to save the changes made with Setup in CMOS/NVRAM and to exit from Setup. When you select this item, Setup is terminated and the system cold reset is performed automatically.
Exit Discarding Changes	—	Exits from Setup without saving the changes. Select this item to exit from Setup without saving the changes made with Setup in CMOS/NVRAM. When you select this item, Setup is terminated and the boot process continues.
Load Setup Defaults	—	Restores the initial values (default values). Select this item to reset all values of Setup to the default values.
Discard Changes	—	Restores the settings before changes were made. Select this item to discard the changes just made.
Save Changes	—	Saves the changes to the settings and continues Setup. Select this item to save the settings selected in CMOS/NVRAM without exiting from Setup.

BIOS Virtual DIP Switch

What is BIOS Virtual DIP Switch?

SP command “su” specifies the settings of the BIOS virtual DIP switch. When the setting value specified in Table 4-28 is set to the BIOS virtual switch, the BIOS performs the operation described in the table. A logical-or of the setting value in Table 4-28 can be set to the BIOS virtual DIP switch. When this happens, the BIOS performs plural operations at the same time.

⚠ CAUTION

Changing a setting can cause the server to lose system configuration information. Use the virtual DIP switch function with caution. Call your system administrator or NEC Technical Support personnel for help before setting this switch.

Table 4-28. Virtual DIP Switch Setting Value

Setting Value	Operation
80000000	Clears CMOS/NVRAM entirely.
40000000	Clears the Supervisor/User Password specified by Setup.
20000000	Clears only the area of CMOS/NVRAM used by the BIOS.
10000000	Clears only the area of NVRAM used by EFI/OS.
00000100	PCI-X Performance Increase
00001000	USB FDD ATAPI emulation mode
00002000	Disable I/O slot power control from OS
00000004	Enables CMC 1H Mask function.
00000002	BIOS/EFI can use USB devices.
00000001	Disables PCI Online Maintenance function.
00003102	Windows Server 2003
00000000	Linux (NEC Linux)

Note: PCI Online Maintenance means PCI Hot Plug

CMOS/NvRAM Clear (80000000/40000000/20000000/10000000)
For information on the setting value to clear CMOS/NvRAM, refer to “When You Should Change the Settings” earlier in this chapter. The setting value is cleared to “0” when CMOS/NvRAM is cleared.

Enables CMC 1H Mask function (00000004)
Setting the bit to “1” enables the CHC 1H Mask function. If the bit is not cleared to “0”, the bit setting value “1” remains. SP command “su” is used to clear the bit to “0”.

BIOS/EFI can use USB devices (00000002)
Setting the bit to “1” enables the BIOS/EFI to use USB devices. If the bit is not cleared to “0”, the bit setting value “1” remains. SP command “su” is used to clear the bit to “0”.

Disables PCI online maintenance function (00000001)
Setting the bit to “1” disables the PCI online maintenance function. If the Operating System does not support PCI online maintenance, the bit should be set to “1”. System startup may be faster. If the bit is not cleared to “0”, the bit setting value “1” remains. SP command “su” is used to clear the bit to “0”.

PCI Online Maintenance (PCI Hot Plug)

This section describes the Setup Menu operations/procedures required prior to the PCI online maintenance operation. An online maintenance available PCI card requires resources such as PCI Gap, I/O resource, and PCI bus. Prepare those resources correctly with each configuration menu beforehand.

Available PCI Online Maintenance Function

The server supports the following PCI Online Maintenance functions:

- Online Add (Adding PCI card)
  Installs an online maintenance available PCI card into a PCI slot that accepts online maintenance without stopping the OS. An online maintenance available PCI card requires resources. The resources must be prepared prior to the online maintenance operation with the Setup Menu.
- Online Remove (Extracting PCI card)
  Extracts an online maintenance available PCI card from a PCI slot that accepts online maintenance without stopping the OS. This operation is performed when the PCI card may be defective. Preparing resources is not required.
- Online Replace or online Repair
  Extracts an operating online maintenance available PCI card from a PCI slot that accepts online maintenance without stopping the OS. This procedure installs a new online maintenance available PCI card into the PCI slot that accepts online maintenance without stopping the OS. The new card may be the same type as the extracted one, or may be another type. Preparing the resources is not necessary if the new card is the same type, but is necessary if the new card is another type.

Preparing the Resources

Use the following procedures to prepare resources for an online maintenance available PCI card.

1. Select the online maintenance available slot and device.

   Select a PCI slot that accepts online maintenance and select an online maintenance available device installed in the slot.

2. Calculate required resource size.
   - Confirm the resource size that the online maintenance available devices require.
   - If plural online maintenance available PCI devices are installed in the PCI slots under the same PCI bus, the sum of the resources of all PCI devices must be calculated beforehand.
3. Specify the required resources.
   - Start up the system and activate BIOS Setup.
   - Select “System Hardware” in the Main Menu.

- Select “HBB Configuration” in the System Hardware menu.
- Specify resources as follows. Use the resource size calculated in step 2.

  PCI Gap:

  “Low MMIO Configuration” menu or “High MMIO Configuration” menu specifies PCI Gap (see “Low MMIO Configuration Submenu” and “High MMIO Configuration Submenu.)”

  “Low MMIO configuration” menu is used when the PCI Gap is assigned to the address space that is less than 4GB.

  “High MMIO Configuration” menu is used when the PCI Gap is assigned to the address space that is larger than 4GB. Use the following procedure to enable the specified values in “High MMIO configuration” menu:

  — Select “System Hardware.”

  — Select “Memory Mapped I/O > 4GB” in System Hardware menu.

  — Select “Enable” in Memory Mapped I/O > 4GB submenu (see “Memory Mapped I/O > 4GB submenu”).

  I/O Space:
  See “IO Space Configuration Submenu.”

  PCI Bus Number:
  See “PCI Bus Configuration Submenu.”

If a Reboot Occurs

When procedures are completed in the previous section, “Preparing the Resources,” exit from the Setup menu. Select “Exit Saving Changes” from the Exit menu (see “Exit Menu”).

Reboot the system. A reboot might occur again during the reboot process. Two possible causes for reboot are:

- Expanded PCI Gap was specified in preparing the resources (see “Procedures for Preparing the Resources”).
- The resource values specified in preparing the resources were incorrect (see “Procedures for Preparing the Resources”).

If an expanded PCI Gap was specified:
Reboot. The following BIOS event log is generated: “910A Low MMIO Space Size Updated.”

The second reboot occurred because the PCI Gap (Low MMIO) had expanded. The second reboot is a correct procedure. The system operation can be continued when the reboot procedure is completed.

If a reboot occurred due to incorrect resource values:
The “910E Resource Assignment Failure” BIOS event log is generated.

The system checks whether the sum of the resource size is larger than the total resource size of the system during system initialization. When the sum of the resource size is larger than the total resource size, the BIOS event log is generated and the system reboots again. During the second reboot, the resource size that exceeds total resource size is set to the initial value. The resource size must be specified correctly. Any other resource size specified correctly is maintained.

5

I/O Board Installation

- Identifying PCI Slots
- Selecting a Slot for Optimal Operation
- Installing a Board

This chapter provides information for adding I/O boards to the Express5800/1160Xd/1320Xd PCIX Unit. Only a technically qualified person should integrate and configure I/O boards into the server.

⚠ CAUTION

Server options other than I/O boards require installation and configuration by a trained NEC technician.

Identifying PCI Slots

The PCIX unit has 14 PCI-X slots. One Basic I/O Board can be installed in this unit to support the standard I/O interface.

Figure 5-1 shows the PCI slots in the PCIX unit, Table 5-1 lists board/card allocations for the PCI slots in the PCIX unit, Figure 5-2 shows 66-MHz slots assigned to two bus groups in the PCIX unit, and Table 5-2 lists PCI slot addressing in the PCIX unit.

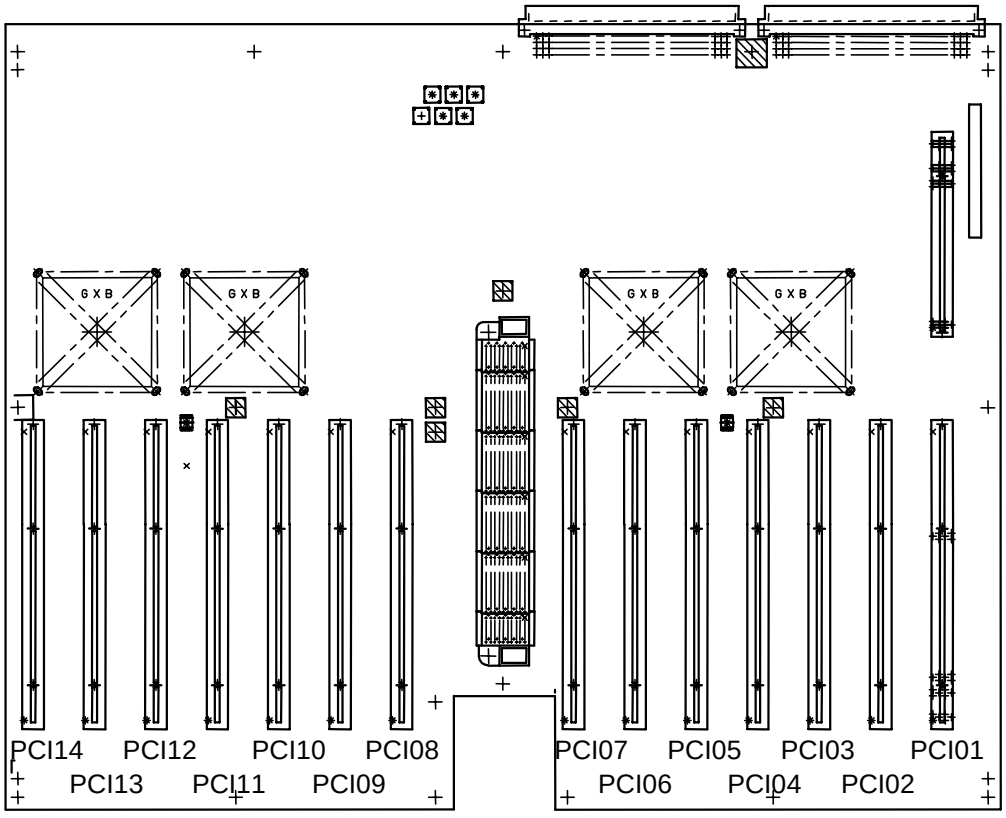
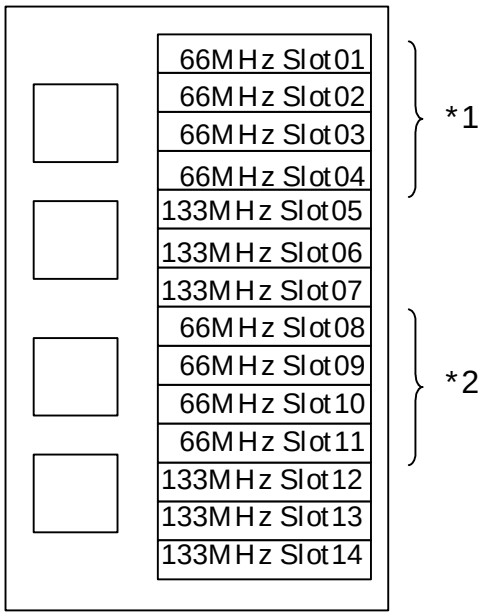


Figure 5-1. PCI Slots in the PCIX Unit

Table 5-1. PCI Slot Allocation in the PCIX Unit

Configuration	Slot Number	Board/Card Type	Comments
Basic I/O Board, VGA Board, SCSI Cards (for DAT and Device Bay)	PCI01	Basic I/O Board*	DVD: Connected by IDE interface.
	PCI02	SCSI Card	DAT: Connected by SCSI interface.
	PCI03	VGA Card*	
	PCI04 ~ PCI13	Free Slots	
	PCI14	SCSI Card	Device Bay: Connected by SCSI interface
SCSI Cards (for DAT and Device Bay)	PCI01	SCSI Card	DAT: Connected by SCSI interface.
	PCI02 ~ PCI13	Free Slots	
	PCI14	SCSI Card	Device Bay: Connected by SCSI interface
SCSI Card (for Device Bay)	PCI01 ~ PCI13	Free Slots	
	PCI14	SCSI Card	Device Bay: Connected by SCSI interface

*Configuration for Core PCIX Unit.



*1: 66-MHz slots on Slots 01 to 04 bus group.
*2: 66-MHz slots on Slots 08 to 11 bus group.

Figure 5-2. PCI Slots and Bus Groups in the PCIX Unit

Note: Installation of a board in a particular slot and with other boards can determine the actual operating frequency of a board within a bus group. See the next section “Selecting a Slot” for information about installing a board in a particular slot for optimum operation. Also see Table 5-2 for PCI slot addressing which includes Host Bus Bridge number information.

Table 5-2. PCI Slot Addressing in the PCIX Unit

Physical PCI Slot	Slot Speed (MHz)	Host Bus Bridge (HBB)	PCI Bus	GXB	GSL	IOC
1	66	0	0	0	0	0
2	66	0	0	0	0	0
3	66	0	0	0	0	0
4	66	0	0	0	0	0
5	133	1	1	0	0	0
6	133	4	0	2	1	0
7	133	5	1	2	1	0
8	66	6	0	3	0	1
9	66	6	0	3	0	1
10	66	6	0	3	0	1
11	66	6	0	3	0	1
12	133	7	1	3	0	1
13	133	2	0	1	1	1
14	133	3	1	1	1	1

Selecting a Slot

Installation can impact the operating frequency of a board. Note the following information before selecting a PCI slot:

> ***Note:*** See Figure 5-1, Table 5-1, Figure 5-2, and Table 5-2 for PCIX Unit slot locations and addressing. These tables and figures show slot frequencies, bus groups, and slot addressing information.

The actual operating frequency of a board is lower than the highest specified operating frequency when the following conditions occur:

- More than two PCI boards are installed in the same bus group (does not apply to PCI-X boards)
- Boards with different operating frequencies are installed in the same bus group.

PCI 33-MHz is the highest specified operating frequency for the following boards:

- Basic I/O Board
- SCSI Card DAT device in the server chassis.

See Table 5-3 for information about how installation in a particular slot and with other boards can determine the operating frequency of boards within the bus group. Also see Table 5-2 for PCI slot addressing in the PCIX unit.

Table 5-3. Board Installation and Operating Frequencies

Board Type	Installation	Operating Frequency
PCI 33-MHz board	Installed within the same bus group with other boards having a higher operating frequency than 33-MHz	Operating frequency of all boards is 33 MHz.
PCI 66-MHz board	Up to 2 boards installed within the same bus group Three or more boards installed within the same bus group	Operating frequency of boards is 66 MHz. Operating frequency of all boards is 33 MHz.
PCI-X 66-MHz board	All slots within the same bus group are occupied with PCI-X 66-MHz boards	Operating frequency of all boards is 66-MHz. Operating frequency does not decrease as in PCI examples.
PCI-X 133-MHz board	Installed in 66-MHz slot	Operating frequency is limited to 66 MHz; installation in 66-MHz slot is not recommended.

Installing a Board in the PCIX Unit

Note: Before you install an I/O board, see the previous sections to choose the correct slot location for your board.

⚠ CAUTION

Electrostatic discharge (ESD) and ESD protection. ESD can damage disk drives, boards, and other parts. We recommend that you wear an antistatic wrist strap attached to chassis ground (any unpainted metal surface) on your system when handling parts.

ESD and handling boards. Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the system, place it component-side up on a grounded, static-free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

Access covers, proper cooling and airflow. For proper cooling and airflow, always install access covers before turning on the system. Operating it without the covers in place can damage system parts.

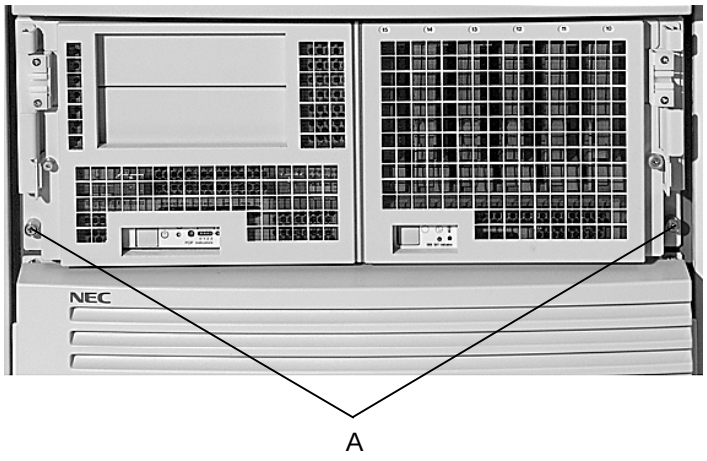
Note: I/O boards are hot-pluggable. Installation does not require shutting down the system. This feature must be supported by the operating system for it to be utilized online.

1. Check that the front stabilizer is in the pulled-out position. If not, remove the screw securing the stabilizer and pull it out (see Figure 5-3).

A Front Stabilizer

Figure 5-3. Stabilizer and PCIX Unit Front Bezel

2. Remove the front bezel from the front of the PCIX unit by pulling it first from the bottom and then away from the top of the unit.
3. Remove the two screws (one on each side) securing the PCIX unit to the front of the cabinet (see Figure 5-4).



A Server Screws (2)

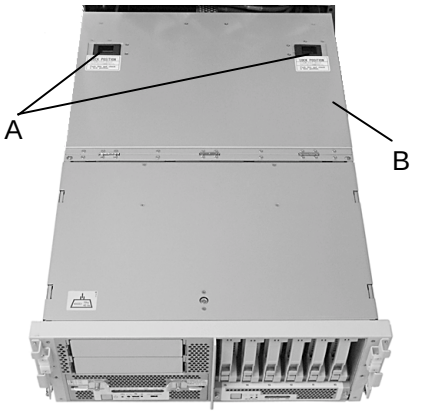
Figure 5-4. PCIX Unit Screws

4. Carefully and slowly pull the PCIX unit out of the cabinet until the side rails lock (click) in place.

⚠ CAUTION

Check that the cables at the rear of the cabinet are free from being pinched or damaged when you slide the PCIX unit forward.

5. Lift and swing the PCIX unit PCI slot access cover open (see Figure 5-5).



A Cover Handles

B PCIX Unit PCI Slot Cover

Figure 5-5 PCIX Unit PCI Slot Access Cover

6. Install the board in the appropriate slot.

Note: See the previous sections in this chapter to select the correct slot for your board type. Correct slot location can optimize board performance.

- Carefully remove the slot cover.

⚠ WARNING

Take care when removing the slot cover. System power is on during this installation. Dropping a slot cover can create a short circuit, causing personal injury and damage to the system if the slot cover makes contact with a connector.

- Insert the board into the slot.

7. Replace the access cover (see Figure 5-5).
   - Swing the cover back over the slots.
   - Press the cover down and check that the cover latches are secured.

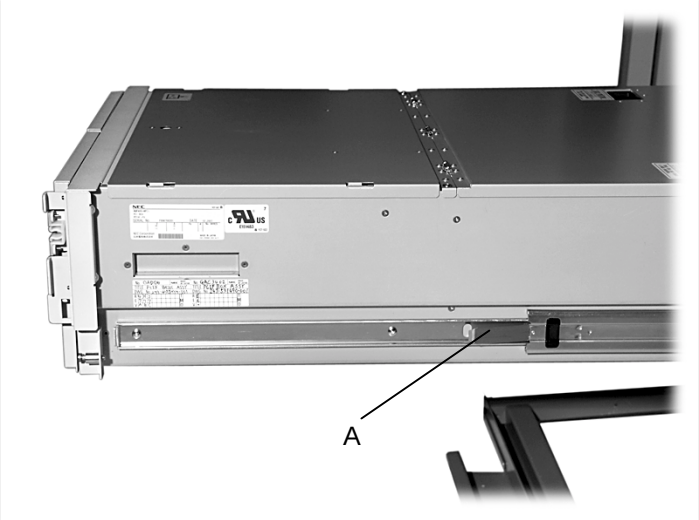
⚠ CAUTION

To prevent damage to the cover and chassis, check that the cover is secured and can clear the chassis when you slide the unit into the server.

8. Carefully press two rail latches (one on each side) and slowly slide the PCIX unit back into the cabinet. Stop sliding if you feel resistance and check for pinched or pulled cabling at the rear of the cabinet.

⚠ WARNING

Take care when releasing the latches and sliding the chassis to avoid pinching your fingers.



A Right Rail Latch

Figure 5-6 PCIX Unit Rail Latches (right side shown)

9. Carefully and slowly slide the chassis all the way into the cabinet. Replace the two screws to secure the PCIX unit (see Figure 5-4).

10. Connect any I/O board cable at the rear of the server.

⚠ CAUTION

When connecting a cable to an I/O board, be sure to leave enough cable free for sliding the PCIX unit chassis out of the cabinet. Route the cable so it does not get pinched or damaged.

11. Replace the front bezel by first aligning it at the top of the unit and then pressing the bezel firmly against the unit to secure it.

6

Problem Solving

- Solving Simple Problems
- Troubleshooting the System

Solving Simple Problems

Some system problems are simple ones and easy to solve. Check the corrective actions to the general problems in the following table. If you still have a problem, record the conditions of the problem and contact your system administrator or NEC support personnel.

⚠ WARNING

Some locations within the server have high voltage and therefore are very dangerous. To avoid risk of electric shock, turn off all server power and disconnect power cables.

The main power of your server is turned off by turning off the power distribution board or removing the power cable.

Before touching the parts in the server, wait for at least 10 to 15 seconds until residual voltage is discharged.

⚠ CAUTION

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground when handling system components.

Electronic devices can be easily damaged by static electricity. To prevent damage, keep them in their protective packaging when they are not installed in your system.

Table 6-1. Checklist for Solving General Problems

Symptom	Corrective Action
No power. You turned on AC power breakers for both Power Bay Units at the rear of the cabinet.	Check that power is on to the main AC power source. Check that AC power cables are connected to the AC power receptacles on both Power Bay Units.
Nothing is displayed on the console.	Check that the console power is on. Check that the Service Processor Boards and the console are properly connected. • Are the cables correct? • Are the connectors fully inserted? Check whether the screen display is suppressed by any software by moving the mouse or pressing the Shift key. Check if the console brightness setting needs adjustment.

Table 6-1. Checklist for Solving General Problems (cont'd)

Symptom	Corrective Action
Nothing is displayed on the console. (cont'd)	Check that the VGA card in the PCIX Unit and the console are connected properly.
Cannot enter commands on the console.	Check that the keyboard and mouse are connected properly. Check that the Basic I/O Board in the PCIX Unit and the keyboard and/or mouse are connected properly. • Are the cables correct? • Are the connectors fully inserted?
Operating system doesn't start up.	Check that power LEDs on installed boards are on. If you started up the system from the DVD-ROM drive in the PCIX Unit, check that the DVD/CD-ROM disc is inserted correctly. If you started up the system from the DAT drive in the PCIX Unit, check that the tape cartridge is inserted correctly.
Cannot read a DVD/CD-ROM disc.	Check that the DVD-ROM drive LED is on (green). Check that the data is properly recorded on the DVD/CD-ROM disc. Prepare several DVD-ROMs and repeat the operation with these discs. Check that the DVD-ROM drive is operating correctly. Load the DVD-ROM in the DVD-ROM drive and execute T&D to check the operation of the DVD.
Cannot read a digital audiotape.	Check that the DAT drive LED is on (green). Check that the data is properly recorded on the digital audiotape. Prepare several tapes and repeat the operation with these tapes. Check that the DAT drive is operating correctly. Load the tape in the DAT drive and execute T&D to check the operation of the DAT.

Troubleshooting the System

Your server provides several methods for detecting problems in the system:

- LED status indicators on hardware components, such as boards and drives
- Error messages, logs, and status displayed on a monitor from the integrated iSP Service Processor.

Hardware diagnostics from LED status requires accessing boards integrated in the server. Hardware diagnostics should be done by trained NEC Support personnel. Record any error messages displayed on the console and provide the information to the NEC Support technician.

The service processor provides the following functions for system status and diagnostics:

- Virtual SOP – displays the system operating state for each partition with periodic updates. It displays partition configuration information and failure information (see "Virtual SOP" in Chapter 3.
- OS Console – redirects the serial input/output for the operating system (including BIOS).
- SP Command Console – allows you to monitor service processor output messages required for system operation and maintenance and to enter commands for the service processor. The SP Command Console lets you run commands required for system operation.

From the iSP Main Menu, you can switch the SP Command Console from normal operation to maintenance mode by entering the change command mode "CM" command at the iSP prompt.

Some of the commands you can use for troubleshooting include:

- HC command to display and/or modify hardware configuration, including partitions.
- DL to display the logs stored in iSP.
- DT to display the SP RTC and to set it.
- EN to display environmental information such as power state and temperature status.

See Chapter 3, "Service Processor" for detailed information for using the iSP service processor functions.

A

Technical Specifications

- Main Cabinet
- DVD-ROM Drive
- Tape Drive
- FDD

This appendix provides the technical specifications for your server.

Main Cabinet

Table A-1 lists the technical specifications for the Main Cabinet.

Table A-1. Main Cabinet Technical Specifications

Item	16-Way System (1160Xd)	32-Way System (1320Xd)
Cell Board		
Number of Cell Boards	Up to 4 boards (two boards required for redundancy)	Up to 8 boards (two boards required for redundancy)
CPU		
Processor	Intel® Itanium® 2 1.5-GHz or 1.3-GHz processor	
Number of Processors	Up to 4 processors per Cell Board, 16 processors per cabinet	Up to 4 processors per Cell Board, 32 processors per cabinet
Cache	L1 — Instruction 16KB + Data 16KB L2 — 256 KB L3 — 6 MB/1.5GHz processor; 3 MB/1.3-GHz processor	
Main Memory		
Type No. of DIMM Slots Expansion Minimum Memory	1-GB DDR DIMM 32 per Cell Board/Daughter Board 4-GB; installed in units of 4 DIMMs 4 GB	
Maximum Memory (with 1-GB DIMMs)	32 GB/Cell Board 128 GB/cabinet	32 GB /Cell Board 256 GB/cabinet
I/O Processing		
No. of 1.6GB Interface*	2/XBC Board, 4/cabinet	2/XBC Board/8/cabinet
Max. No. of PCI Slots	14/PCIX Unit, 56/system	14/PCIX Unit, 112/system
Max. I/O Bandwidth	6.4GB/s per Cell Board	
Interconnection Between Cell Boards		
Method	Crossbar switch	
Max. Operating Frequency	400 MHz	
Max. Bandwidth	25.6 GB/s	51.2 GB/s
Optional Units		
PCIX Unit (optional)**	8 slots supporting 66-MHz PCI bus 6 slots supporting 133-MHz PCI bus Connected via 1.6 GHz interface x1 (single) Connected via 1.6 GHz interface x2 (redundant)	

*Dedicated cable interface connects PCIX Units; 11.48 ft (3.5m) maximum length.

**At least one PCIX Unit is required. Up to two units can be installed in the 32-way (1320Xd) server cabinet.

Table A-1. Main Cabinet Technical Specifications (cont'd)

Item	16-Way System (1160Xd)	32-Way System (1320Xd)
Optional Units (cont'd)		
Magnetic Tape Unit	Optional One unit in optional PCIX Unit DDS-4 4mm DAT device	
USB FDD	Optional One unit in optional PCIX Unit USB interface	
Hard Disk Storage	Optional Up to 6 drives in optional PCIX Unit 36.3 GB, 73.2 GB, or 146 GB SCSI	
Dimensions	Width: 23.6 inches (600 mm); with stabilizer area: inches (1100)mm Height: 70.9 inches (1800 mm) Depth: 41.3 inches (1050 mm)	
Weight	Up to 925.9 lbs (420 kg), depending on system components	
Environment		
Operating	Temperature: 41° to 89.6°F (5° to 32°C) Relative Humidity: 20% to 80% (non-condensing)	
Non-operating	Temperature: 41° to 113°F (5° to 45°C) Relative Humidity: 8% to 80% (non-condensing)	
Power Supply		
Voltage	Single phase, 200-240V $\pm$10%	
Frequency	50/60Hz $\pm$1Hz	
Power Consumption (maximum configuration)	6.7KVA	13.2KVA

DVD-ROM Drive

Table A-2 lists the technical specifications for the DVD-ROM drive in the optional PCIX Unit.

Table A-2. DVD-ROM Drive Technical Specifications

Item	Specification
Media	CD-ROM Mode 1, 656 MB Mode 2, 748 MB DVD-ROM Singe-sided, 4.7 GB Double-sided, 8.54 GB
Data Transmission Rate	CD-ROM: Max 7.2 MB/s DVD-ROM: Max 21.1 MB/s
Interface	ATAPI
Data Buffer	256 KB
MTBF	125000H
Dimensions	Width: 5.75 inches (146 ±0.4 mm) Height: 1.63 inches (41.3 ±0.4 mm) Depth: 7.48 inches (190 ±0.4 mm)
Environment Operating Non-operating	 Temperature: 41° to 122°F (5° to 50°C) Relative Humidity: 5% to 90% (non-condensing) Temperature: -22° to 149°F (-30° to 65°C) Relative Humidity: 5% to 95% (non-condensing)

Tape Drive

Table A-3 lists the technical specifications for the optional tape drive in the optional PCIX Unit.

Table A-3. Optional Tape Drive Technical Specifications

Item	Specification
Corresponding standard and memory capacity	DDS4 150m 40GB DDS3 125m 24GB DDS2 120m 8GB DDS1 90m 4GB (Supports read-only)
Average Transmission Rate	Non-compression: 3 MB/s Compression (2:1): 6 MB/s
Interface	SCSI-2
Memory Buffer	8 MB
MTBF	400,000H
Life Time	Tape Access 6000H
Dimensions	Width: 4 inches (101.6 mm) Height: 1.6 inches (41.3 mm) Depth: 5.9 inches (150 mm)
Environment Operating Non-operating	 Temperature: 41° to 104°F (5° to 40°C) Relative Humidity: 20% to 80% (non-condensing) Temperature: -40° to 158°F (-40° to 70°C) Relative Humidity: 5% to 95% (non-condensing)

FDD

Table A-4 lists the technical specifications for the optional FDD drive in the optional PCIX Unit.

Table A-4. Optional FDD Technical Specifications

Item	Specification
Media	2HD: 2.0 MB or 1.6 MB 2DD: 1.0 MB
Data	2HD: 500 kbits/s 2DD: 250 kbits/s
Interface	USB
Dimensions	Width: 4.1 inches (103.5 mm) Height: .67 inches (17 mm) Depth: 5.6 inches (142 mm)
Environment Operating Non-operating	 Temperature: 41° to 104°F (5° to 40°C) Relative Humidity: 30% to 80% (non-condensing) Temperature: -40° to 140°F (-40° to 60°C) Relative Humidity: 5% to 95% (non-condensing)

B

Memory Upgrades

- Memory Configurations
- DIMM Installation

This appendix provides the memory configuration and installation information for your server.

⚠ CAUTION

Memory upgrades for your server require installation and configuration by trained NEC personnel.

Memory Configurations

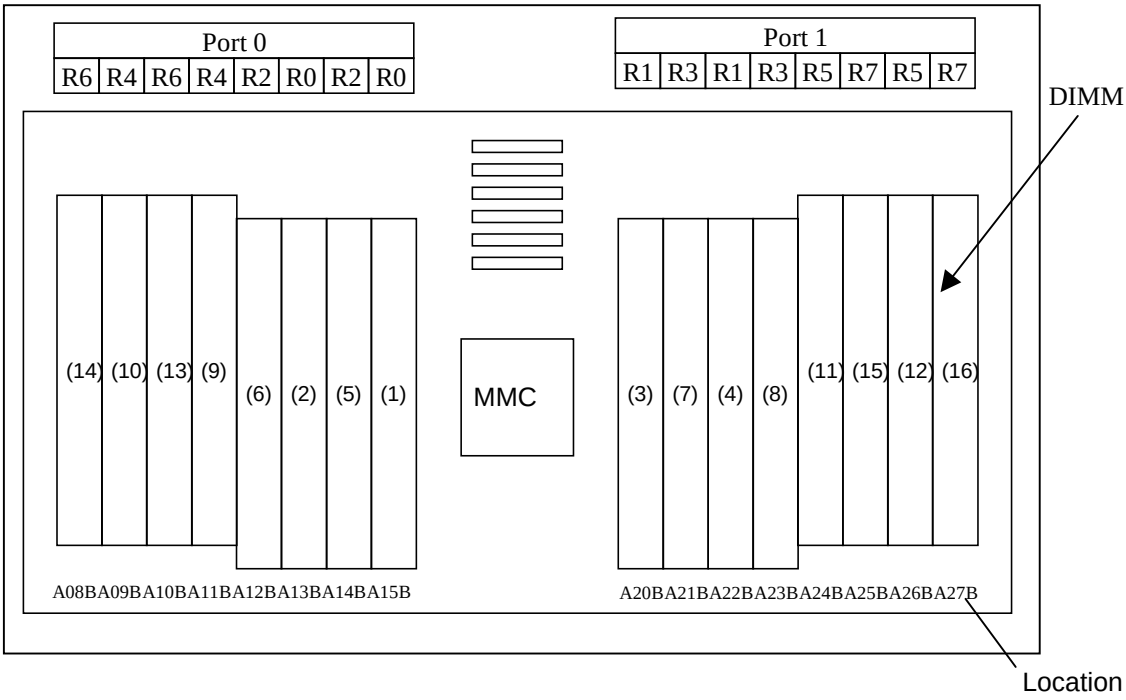
Each Cell Board supports up to 32 DIMMs (16 on the Cell Board and 16 on the memory daughterboard) in the following configurations:

- Memory must be installed in groups of 4 DIMMs of the same capacity.
- Memory capacity can vary between different groups
- At least one group of four DIMMs is required in the system.
- Each Cell Board and daughterboard combination supports up to 8 groups of 4 DIMMs.
- Memory groups include:
  - group of four 512-MB DDR DIMMs for total capacity of 2 GB in a group
  - group of four 1-GB DDR DIMMs for total capacity of 4 GB in a group.
- Maximum memory capacity using 1-GB DIMMs is 32 GB per Cell Board/daughterboard.

DIMM Installation

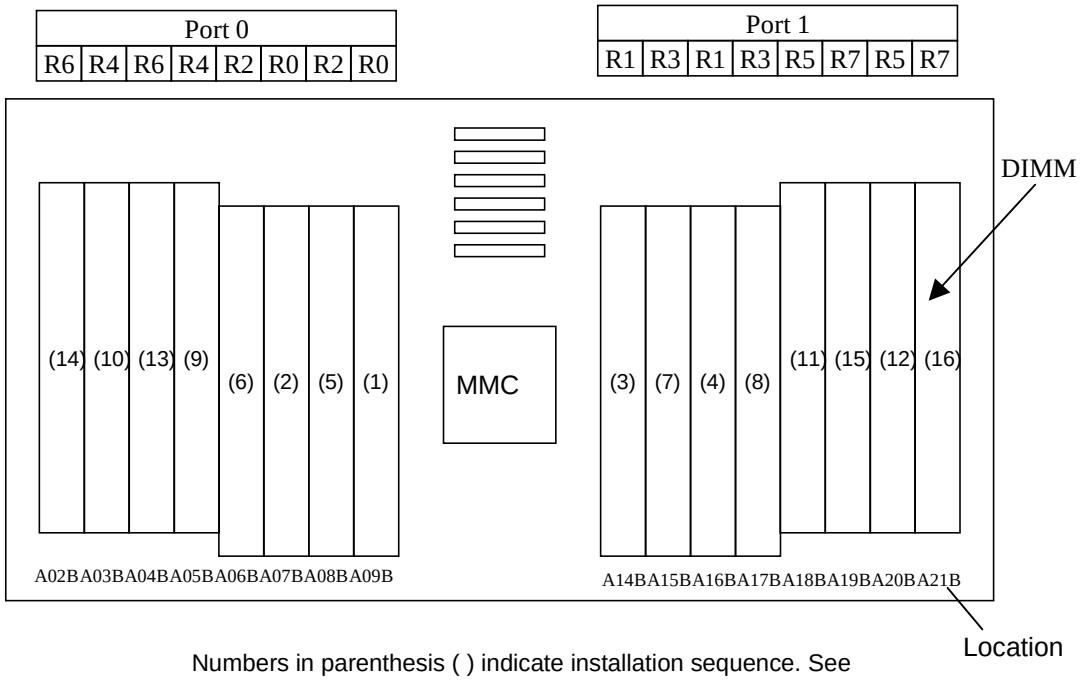
Figure B-1 shows the DIMM slot locations on the Cell Board, Figure B-2 shows DIMM slot locations on the Memory Daughterboard. Table B-1 provides detailed memory installation configuration information.

Note: DIMMs must be installed in a specific order, for example, Cell Board Row #0,1, Memory Daughterboard #0,1, Cell Board Row #2,3, etc. See the following figures and table for the correct sequence and location.



Numbers in parenthesis ( ) indicate installation sequence. See Table B-1 for reference.

Figure B-1. Cell Board DIMM Installation Locations



Numbers in parenthesis ( ) indicate installation sequence. See Table B-1 for reference.

Figure B-2. Memory Daughterboard DIMM Installation Locations

Tble B-1. DIMM Installation

Installation Sequence	DIMM Board	Row	DIMM Slot Location	Sequence in Figure B-1	Sequence in Figure B-2
1	Cell Board	0	A15B, A13B	(1), (2)	--
		1	A20B, A22B	(3), (4)	--
2	Memory Daughter-board	0	A09B, A07B	--	(1), (2)
		1	A14B, A16B	--	(3), (4)
3	Cell Board	2	A14B, A12B	(5), (6)	--
		3	A21B, A23B	(7), (8)	--
4	Memory Daughter-board	2	A08B, A06B	--	(5), (6)
		3	A15B, A17B	--	(7), (8)
5	Cell Board	4	A11B, A09B	(9), (10)	--
		5	A24B, A26B	(11), (12)	--
6	Memory Daughter-board	4	A05B, A03B	--	(9), (10)
		5	A18B, A20B	--	(11), (12)
7	Cell Board	6	A10B, A08B	(13), (14)	--
		7	A25B, A27B	(15), (16)	--
8	Memory Daughter-board	6	A04B, A02B	--	(13), (14)
		7	A19B, A21B	--	(15), (16)

Two rows (four DIMMs) must consist of DIMMs which have the same capacity. Capacities can vary between different pairs of rows.

C

Windows 2003 Installation

- Installing Microsoft Windows 2003
- Creating a Mirrored Drive of Windows 2003

This appendix provides information for installing Microsoft® Windows® 2003 on the Express5800/1000 series server and for creating a mirrored drive of Windows 2003. Follow the procedures in sequence.

Installing Microsoft Windows 2003

Use the following procedure to install Microsoft Windows 2003 on the NEC Express5800/1000 series server.

Use a disk drive that does not contain any system partitions. A newly-formatted disk is best.

1. Set Virtual DIPSW to 00003102 (see "BIOS Virtual DIP Switch" in Chapter 4).
2. Set Shrink Interrupts in BIOS (see "Shrink Total Number of Interrupt Vectors Submenu" in Chapter 4).
   - For Enterprise Edition, set to **ON**.
   - For Datacenter, set to **OFF**.
3. Check that the SCSI board is Adaptec ASC39160 (firmware version 3.20 only). You can find the board type/version during the Power-On Self-Test (POST).
4. At the EFI prompt, select the EFI Shell (see "Booting the OS" in Chapter 2).

   Enter **fs0:setupldr** to boot from CD.
5. Select **Automatic install**. The software automatically installs.

   During the installation, the monitor displays: "EMS Connection Detected."

> ***Note:*** EMS (Emergency Management System) allows remote management and recovery without a network in the event of system/software problems.

EMS opens the Special Administration Console (SAC) on the remote terminal (displays text only, no graphics).

```
Computer is booting, SAC started and initialized.

Use the "ch -?" command for information about using channels.
Use the "?" command for general help.

SAC>
EVENT: The CMD command is now available.
```

6. Type **ch?** to display information about using channels. The following screen is displayed:

```
Channel management commands:

ch                          List all commands.

Status legend:  (AB)
A:  Channel operational status
      'A'  =  Channel is active.
      'I'  =  Channel is inactive.
B:  Channel Type
      'V'  =  VT-UTF8 emulation.
      'R'  =  Raw – no emulation.

ch  – si <#>                Switch to a channel by its number.
ch  – sn <name>             Switch to a channel by its name.
ch  – ci <#>                Close a channel by its number.
ch  – cn <name>             Close a channel by its name.

Press <esc><tab> to select a channel.
Press <esc><tab>0 to return to the SAC channel.
```

7. Press **Esc Tab** to find an empty channel. You can now use text-based commands (MS-DOS) for Windows 2003.

8. If operating system redundancy is required, make a mirrored drive of Microsoft Windows 2003 on the NEC Express5800/1000 series server (see the next section).

Creating a Mirrored Drive of Windows 2003

Use the following procedure to create a mirrored drive of Microsoft Windows 2003 on the Express5800/1000 series server.

> ***Note:*** Perform the following procedure ***after*** Windows 2003 is installed and operating on Disk 0.

1. Make Disk 1 GPT. If Disk 1 has been formatted only, use Disk Management to convert Disk 1 to GPT.

2. Delete any partition on Disk 1 (see the following example).

> ***Note:*** Use the following examples as a reference for performing the procedures. Information will vary for your computer and drives.

```
C:\ >diskpart
Microsoft DiskPart version 5.2.3790
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: Your Computer

DISKPART> select disk 1
Disk 1 is now the selected disk.
DISKPART> list partition
  Partition ###  Type            Size       Offset
  -------------  ----------------  -------  -------
  Partition 1    Reserved     128 MB    17 KB
```

[note]: if no partition is displayed, skip to Step 3

```
DISKPART> select partition 1
Partition 1 is now the selected partition.
DISKPART> delete partition override
DiskPart successfully deleted the selected partition.
```

3. Display partitions on Disk 0 as shown below:

```
DISKPART> select disk 0
Disk 0 is now the selected disk.
DISKPART> list partition
  Partition ###     Type          Size       Offset
  -------------     ----------------  -------  -------
  Partition 1       System        345 MB     32 KB   <---- EFI PARTITION ON
  Partition 2       Reserved      996 MB    204 MB         PRIMARY
  Partition 3       Primary      2000 MB   3200 MB
  Partition 4       Reserved      126 MB      9 GB   <--- WINDOWS RESERVED
                                                          PARTITION
```

4. Create mirror partitions on Disk 1 as shown below:

```
DISKPART> select disk 1
Disk 1 is now the selected disk.
DISKPART> create partition efi size=345
DiskPart succeeded in creating the specified partition.

DISKPART> create partition msr size=126
DiskPart succeeded in creating the specified partition.
DISKPART> list partition
  Partition ###  Type            Size       Offset
  -------------  ----------------  -------  -------
   Partition 1    System        345 MB     17 KB   <---- NEW EFI PARTITON
  *Partition 2    Reserved      126 MB    204 MB   <---- NEW MSR PARTIION ON
                                                          YOUR_COMPUTER
```

5. Assign drive roles as shown below:

```
DISKPART> select disk 0
Disk 0 is now the selected disk.
DISKPART> select partition 1
Partition 1 is now the selected partition.
DISKPART> assign letter=p
DiskPart successfully assigned the drive letter or mount point.
DISKPART> select disk 1
Disk 1 is now the selected disk.
DISKPART> select partition 1
Partition 1 is now the selected partition.
DISKPART> assign letter=s
DiskPart successfully assigned the drive letter or mount point.
DiskPart>exit
```

6. Format Disk 1 from command line as shown below:

```
C:\>format s:  /fs:fat  /q  /y

The type of the file system is RAW.
The new file system is FAT.
QuickFormatting 204M
Initializing the File Allocation Table (FAT)...
Format complete.
  213,680,128 bytes total disk space.
  213,680,128 bytes available on disk.
        4,096 bytes in each allocation unit.
       52,168 allocation units available on disk.
           16 bits in each FAT entry.
Volume Serial Number is EA34-03C7
```

7. Copy contents from Drive 0 to Drive 1 as shown below:

> ***Note:*** Make sure you are at the root directory C:\.

```
c:\>xcopy p:\*.*  s:  /s  /h

c:\boot.nvr
c:\SETUPLDR.EFI
c:\EFI\Microsoft\WINNT50\Boot0003
c:\EFI\Microsoft\WINNT50\ia64ldr.efi
c:\EFI\Microsoft\EFIDrivers\fpswa.efi
c:\MSUtil\diskpart.efi
6 File(s) copied
```

8. Convert Drive(s) to Dynamic.

Use Windows Disk Administrator to convert Disk 0 and Disk 1 to Dynamic.

9. Mirror the drives.

Use Windows Disk Administrator to mirror the drives.

10. Clone the Disk ID (GUID) as shown below.

Note: Use the following examples as a reference for performing the procedures. Information will vary for your computer and drives.

C:\ >**bootcfg /list 0**

Partition table info for Disk: 0

Partition No: 1
Partition Style: GPT
Starting offset: 32,256
Partition length: 213,825,024
Partition GUID: {68d298c0-1b6a-01c1-507b-9e5f8078f531}
GUID type: {c12a7328-f81f-11d2-ba4b-00a0c93ec93b}
Partition name: EFI system partition
.....

C:\ >**bootcfg /list 1**

Partition table info for Disk: 1

Partition No: 1
Partition Style: GPT
Starting offset: 17,408
Partition length: 213,909,504
Partition GUID: {476688c5-8ebf-47d2-80e7-cf9d065edb81}
GUID type: {c12a7328-f81f-11d2-ba4b-00a0c93ec93b}
Partition name: EFI system partition
.....
(*NOTE: The following is an example only. Use the GUID numbers displayed in the previous two steps that appear for YOUR system.*)

C:\>**bootcfg /clone /sg {68d298c0-1b6a-01c1-507b-9e5f8078f531} /tg {476688c5-8ebf-47d2-80e7-cf9d065edb81} /d+ Cloned_Entry**

INFO: Boot entry whose id is '1' successfully cloned.
INFO: Boot entry whose id is '5' successfully cloned.
SUCCESS: The operation completed successfully.

11. Manage the EFI boot menu:

1: Windows Server 2003, Enterprise
2: EFI Shell
3: Boot Mirror C: - secondary plex
4: Windows Server 2003, Enterprise Cloned_Entry
5: Boot Mirror C: - secondary plex Cloned_Entry

- Reboot the partition.
- Enter the EFI boot manager.
- Change the boot order to:

1: Windows Server 2003, Enterprise
2: Boot Mirror C: - Secondary plex Cloned_Entry
3: EFI SHELL

12. Test the process:

C:\ >**bootcfg**

Test the clone by selecting it then booting.

If the mirrored drive boots OK, then the process is complete.

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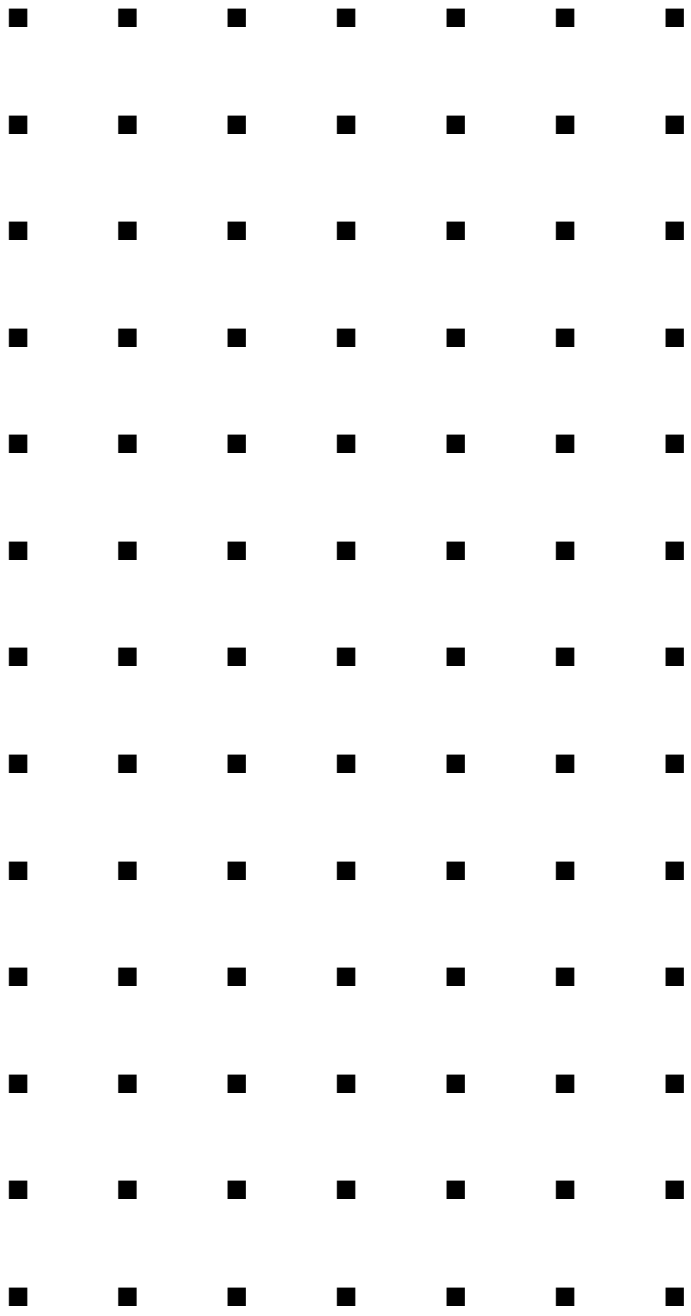

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